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ALSO IN OUR NEWS SECTION
- It's OASIS vs. W3C as Web services standards face possible fragmentation. PAGE 7
- Computer Associates stakes its claim on crowded on-demand computing turf. PAGE 10

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MAY 5, 2003 ▪ VOL. 37 ▪ NO. 18 ▪ $5/COPY

MOBILE & WIRELESS

WIRELESS AT WORK

SPECIAL REPORT

Wireless technology is laboring in some unexpected places these days, supplying the backbone for gritty applications in coal mines, at shipyards and even on the battlefield. Meanwhile, industry pioneers are still testing the technology's limits and inspiring a second generation of wireless adopters.

STORIES BEGIN ON PAGE 27.

ONLINE EXCLUSIVE
A step-by-step checklist for wireless LAN deployment:
QuickLink 37765
www.computerworld.com

RICH LILLASH

Offshore Coding Work Raises Security Concerns

Outsourcing critical software development to foreign workers puts systems at risk, users say

BY DAN VERTON
MYRTLE BEACH, S.C.

SOFTWARE SECURITY

IT professionals are raising serious questions about the U.S. software industry's reliance on overseas software developers, arguing that the practice puts companies and the U.S. economy at risk.

A recent study by Gartner Inc. predicts that by 2004, more than 80% of U.S. companies will consider outsourcing critical IT services, including software development, to countries such as India, Pakistan, Russia and China. But some users said the trend needs to be given a sanity check in light of recent changes in the global security environment.

At last week's Techno-Security Conference here, users peppered a panel of corporate security officers with questions about the wisdom of outsourcing software development to cheap labor overseas, where there is little or no way to ascertain the security risk that workers may pose.

Of particular concern to some attendees is the work that is being sent to China. While not yet a major provider of outsourcing services, China has a significant economic espionage program that targets U.S. technology, the users noted. Also of concern are countries in Southeast Asia, particularly Malaysia and Indonesia, where terrorist networks are known to exist.

Speaking directly to Oracle

Offshore Coders, page 16

YANKEE INGENUITY
An effort is under way to make Vermont an onshore outsourcing center. **Page 16**

Pfizer Moves Broadband Out To Sales Force

Remote workers get routers, VPN software for distributed net

BY BOB BREWIN

Pfizer Inc. plans to have about 10,000 of its 13,000 field sales workers hooked up by year's end to either high-speed cable modem or Digital Subscriber Line services — a project that analysts said would create the largest corporate broadband network built for remote workers thus far.

Jay Stallard, senior manager of business technology and information sciences at Pfizer, said the New York-based pharmaceuticals maker will provide each of the workers with a low-end router and virtual private network software for connecting to the company's back-office systems.

The network hardware be-

Pfizer, page 53

Windows 2003 Compatibility Issues Upset Some IT Pros

Older versions of Exchange, SQL Server won't run on new OS

BY CAROL SLIWA

Some IT managers aren't happy. Others are more understanding. But all of those planning to upgrade to Windows Server 2003 will find that many older versions of Microsoft Corp.'s most popular server applications won't run on the new operating system.

Only SQL Server 2000 with Service Pack 3 can be installed on Windows Server 2003. Users running SQL Server 6.5 or 7.0 will have to upgrade or wait for the SQL release code-

Windows 2003, page 53

Microsoft applications that will run on Windows Server 2003 include

- Application Center 2000 SP2
- BizTalk 2002 SP1
- Commerce Server 2002 SP2
- Content Management Server 2001 SP2 and CMS 2002
- Exchange Server 2003 (summer 2003)
- Host Integration Server 2000 SP1
- Internet Security & Acceleration Server 2000 SP1
- SQL Server 2000 SP3

NEWSPAPER

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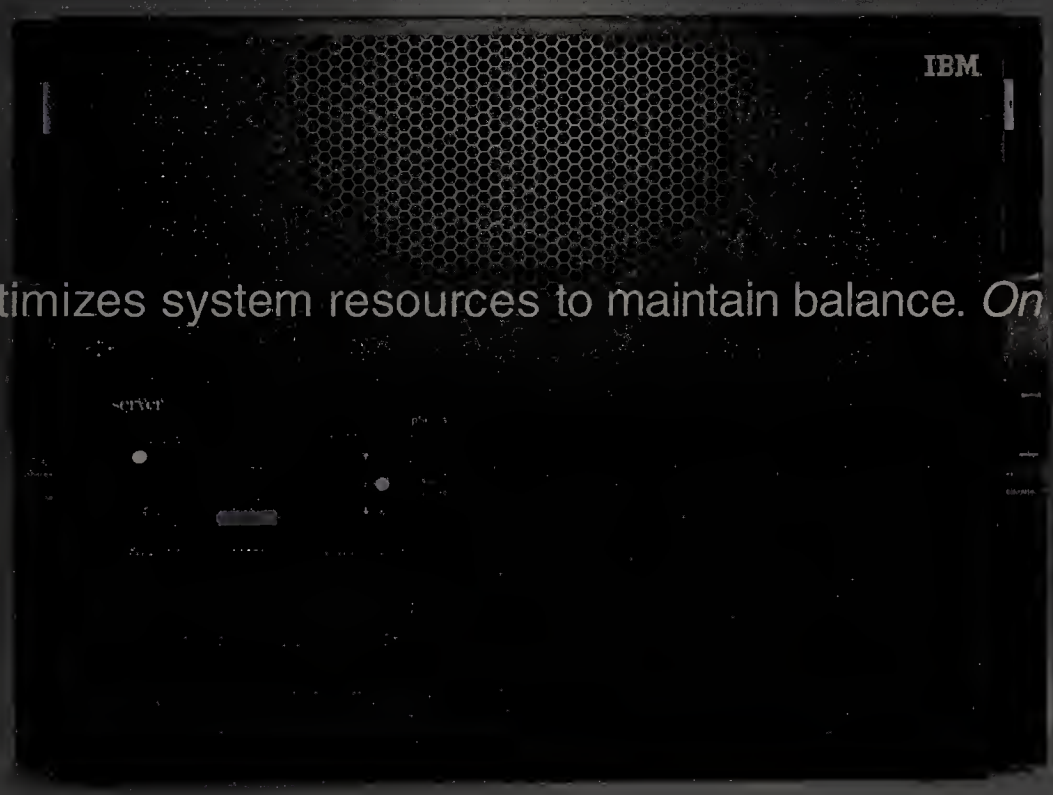

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CONTENTS

05.05.03

NEWS

6 **Oracle database users** express growing interest in Linux.

6 **U.S. companies** doing business in Canada have seven months to comply with a consumer privacy law.

7 **IBM expands its grid** computing offerings, but it doesn't expect much demand until standards are complete.

8 **High-tech CEOs** are facing the economic realities of the marketplace.

10 **Computer Associates groups** six Unicenter tools, joining the push for on-demand computing.

12 **IBM is set** to ship its first storage-area virtualization device for block-level data.

14 **Panelists debate** centralization vs. decentralization of IT governance for effective cost-cutting.

19 **Federal privacy regulations** could hamper access to medical data, according to some researchers.

OPINIONS

Mark Hall 8
Maryfran Johnson 22
Pimm Fox 22
David Moschella 23
Letters 23
Frank Hayes 54

DEPARTMENTS/RESOURCES

At Deadline Briefs 6
News Briefs 8, 14
Company Index 52
How to Contact CW 52
Shark Tank 54

ONLINE

What's a QuickLink?

On some pages in this issue, you'll see a QuickLink code pointing to additional, related content on our Web site. Just enter that code into the QuickLink box, which appears at the top of

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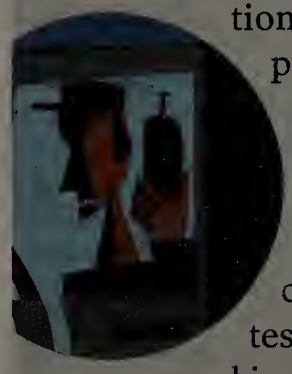
SPECIAL REPORT
MOBILE & WIRELESS

Wireless at Work



Wireless is expanding its job description to include some gritty applications. Read how service technicians, bulldozer operators and police officers use the technology to get their jobs done. Also, industry pioneers are still testing the limits of wireless and inspiring a second generation of adopters. **PACKAGE BEGINS ON PAGE 27.**

30 Wireless Gets Down to Business. In the hands of creative pioneers, wireless technology is breaking new ground, with applications that range from the everyday to the extraordinary. Read about innovative wireless uses in 10 key sectors, including a WLAN upgrade at Carnegie Mellon University led by Chuck Bartel (below, left) and St. Vincent's Hospital's wireless voice technology pilot, led by Jim Stettheimer (below).

38 Working-Class Wireless. Thanks to a wireless system installed on all 10,000 of its trucks, Sears repair technicians can transmit data from customer sites anywhere in the U.S. to the company's back-end systems, says Sears IT executive Dave Sankey (right). Also, read how "smart" bulldozers use wireless to make their way around a coal mine and how a shipyard automatically creates payroll and cost records using wireless.

40 Analyst Report Card. Industry watchers from the top analyst firms weigh in on which wireless segments and vendors are making the grade for corporate IT. Vendors that sell gear and software for WLANs are earning top marks, but most mobile carriers are flunking out, analysts say. Also, results from our online survey reveal what readers had to say about their future wireless plans.

41 Vendor Views. Where is the wireless industry headed? Executives from Cisco, Intel, Enterasys Networks, Symbol Technologies and Proxim offer their takes on the future of WLANs, hardware, standards and security.

42 The Wireless LAN FAQ. Thinking of deploying a WLAN? Read answers to six frequently asked questions about capacity planning, interference and security concerns.

44 On the Heels of the Pioneers. They learned from the leaders, and now these second-generation adopters are adapting wireless technology to meet their own business goals. Read what prompted these smaller companies to go wireless, what tools they used and how their projects are working out.

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Mobile & Wireless News
Get the day's news from *Computerworld*'s Mobile & Wireless World conference in Palm Desert, Calif., featuring end-user case studies and panel discussions. The four-day conference begins Tuesday, May 6.
www.computerworld.com/wireless

Idaho Police Department Installs WLAN Gear
A new Wi-Fi-based network at the Post Falls, Idaho, police department provides patrol officers in a 60-square-mile area with e-mail and direct access to the FBI's National Crime Information Center database.
QuickLink 38105

WLAN Deployment Checklist
Follow this step-by-step guide to ensure proper deployment of your wireless LAN. Read tips on network design, security protection and centralized management.
QuickLink 37765

AT DEADLINE

HP Combines Its Hardware Groups

Almost a year to the day after it acquired Compaq Computer Corp., Hewlett-Packard Co. on May 2 announced a reorganization that includes combining several server and storage hardware groups into a single division. HP said it's also creating a unit that will manage its internal IT operations and business planning, strategy development and enterprise marketing activities.

Microsoft to Demo Security Hardware

Microsoft Corp. will demonstrate its Next-Generation Secure Computing Base technology for the first time at this week's Windows Hardware Engineering Conference 2003 in New Orleans. The vendor plans to devote 18 hours of technical sessions to the hardware-based security initiative, which is aimed at better securing PCs. It was previously codenamed Palladium.

Trade Group Sees Slim Job Growth

The U.S. IT workforce grew by less than 1% in the first quarter compared with the level at the end of 2002, according to a report due to be released today by the Information Technology Association of America (ITAA) in Arlington, Va. Just 86,000 jobs were added to a workforce estimated at about 10.3 million, the ITAA said. Hiring rates likely will remain at a "historic low" for the rest of the year, it added.

Short Takes

AMERICA ONLINE INC., MICROSOFT and YAHOO INC. said they plan to work together to try to limit the amount of spam messages originating from their e-mail services. . . . Former Bush administration cybersecurity official Howard Schmidt said he will become vice president of security at EBAY INC.

Oracle Database Users' Interest in Linux Grows

Conference attendees say they plan to evaluate OS, despite lack of applications

BY MARC L. SONGINI
ORLANDO

OPEN SOURCE

DESPITE THE relative newness of corporate applications running on Linux, attendees at an Oracle database user conference last week said a growing number of companies are evaluating or moving into production with database servers running the open-source operating system.

"Linux is on fire," said Rich Niemiec, president of the Chicago-based International Oracle Users Group (IOUG). In a recent survey of about 100 IOUG members, roughly half indicated that they were interested in running mission-critical Oracle databases on Linux, Niemiec said at the independent user group's annual conference. That's up from only about 15% in a survey conducted a year ago, he added.

Niemiec, who is also CEO of Lombard, Ill.-based TUSC, an Oracle consulting and services firm, attributed the increase in user interest to Oracle Corp.'s alliance with Linux vendor Red Hat Inc. and its support for clustering Linux machines via its Real Application Clusters (RAC) technology.

Andrew Mendelsohn, senior vice president of database and application server technologies at Oracle, said as much as 15% of RAC users are running the clustering technology on Linux systems, up from almost none at this time last year.

Among the companies that are using Linux-based Oracle databases is Aventis Behring LLC, a maker of pharmaceuticals in King of Prussia, Pa. Jesse Crew, manager of global systems at Aventis Behring, said the subsidiary of Paris-based Aventis SA is running more than 10 Hewlett-Packard ProLiant servers equipped with Red Hat Linux and Oracle8i or Oracle9i databases.

For example, Aventis in February went live with a Linux system that supports accounts receivable and electronic data interchange applications. It's saving thousands of dollars in hardware, software and administration costs compared with using high-end Unix boxes, Crew said.

"We're not sacrificing reliability or availability," he noted. "We haven't had any issues with performance. It runs just as well as Unix."

However, the change did require some adjustments on the part of an IT staffer who was used to working with Windows systems, Crew said. More application vendors need to support Linux, he added.

Mendelsohn said Oracle is working "to get the ball rolling" on application support. For example, the company in March announced a program for providing funding to software vendors that agree to port their products to Linux.

> **"We haven't had any issues with performance. [Linux] runs just as well as Unix."**
>
> **JESSE CREW,** MANAGER OF GLOBAL SYSTEMS, AVENTIS BEHRING LLC

William Maguire, CIO at Legato Systems Inc., a Mountain View, Calif.-based maker of data storage software, said he's currently testing Oracle9i on Linux. "The reliability and performance is proven now," said Maguire, although he has not set any rollout plans yet. ▶

BETTER MANAGEMENT
Oracle last week detailed plans to upgrade its database management tools:
QuickLink 38232
www.computerworld.com

Canadian Privacy Law Deadline Approaching

U.S. companies must comply by first of the year

BY JAIKUMAR VIJAYAN

The clock is winding down for U.S. companies that exchange data with other businesses and subsidiaries in Canada to comply with a law providing broad privacy protections for Canadian citizens.

Beginning Jan. 1, 2004, all companies that collect, use or disclose personal information about Canadian citizens during the course of commercial activities will have to comply with Canada's Personal Information Protection and Electronic Documents Act.

"Since Canada is our largest trading partner, a lot of companies will be affected by this," said Mark Rasch, former head of the U.S. Department of Justice's computer crimes unit and senior vice president at Solutionary Inc., a security consultancy in Omaha.

The act is already in effect for banks, airlines, transportation companies and telecommunications firms. It requires businesses to offer Canadian citizens certain guarantees regarding the collection and use of personal data (see box).

It will be a violation to collect data in Canada and then transfer it out of the country, unless the transfer carries with it the same level of protection that's required in Canada, Rasch said.

Companies doing business in Canada must, as of Jan. 1

- Get an individual's consent to collect, use and disclose his personal information.
- Disclose the purpose for which information is being collected at the time of collection.
- Ensure that personal information isn't used for any reason other than the stated purpose.
- Ensure that personal information is retained for only as long as necessary to fulfill the reason for its collection.
- Implement security measures to protect personal data.
- Refrain from sharing an individual's personal information without his prior consent.

The law requires U.S companies to revise online consumer-consent screens and policies, call center procedures, and processes for recording and maintaining consent records, said Robert Parker, a partner at Deloitte & Touche LLP in Toronto. It also requires companies to protect the physical integrity of the data with adequate security and privacy measures, Parker said.

Canadian companies sharing data with U.S businesses must also "ensure the U.S. recipient commits, by contract or otherwise, to the same standards imposed by [the privacy act]," said Michael Miasek, an attorney in the Toronto office of Baker & McKenzie, a Chicago-based law firm that's helping U.S. companies comply with the act.

Since the rules retroactively apply to data collected prior to January 2004, companies will need to determine when and how they collected any data they may have on Canadian citizens and how it's being used, privacy experts said. ▶

Division Over Web Services Standards Work Stirs Debate

IBM, Microsoft choose OASIS over W3C

BY CAROL SLIWA

More than a few feathers were ruffled when the Organization for the Advancement of Structured Information Standards (OASIS) announced last week that a technical committee formed to standardize the Business Process Execution Language for Web Services (BPEL4WS) would hold its first meeting later this month.

Debate has been heated since it became clear that Microsoft Corp. and IBM would submit to OASIS, under royalty-free terms, the BPEL4WS 1.1 specification they co-authored with BEA Systems Inc., SAP AG and Siebel Systems Inc.

That's because another leading standards body, the World Wide Web Consortium (W3C), had already established a choreography working group to address the similar issues of describing, managing and executing business processes that are composed of Web services. The W3C's specification is called the Web Services Choreography Interface, or WSCI.

Oracle Corp., which co-chairs the W3C's choreography working group, said it has worked hard — to date, to no avail — to encourage IBM and Microsoft to bring BPEL4WS to the W3C.

"We were not enthusiastic about Microsoft and IBM going to OASIS," said Don Deutsch, vice president of standards strategy at Oracle. "Primarily, our rationale was we feared fragmentation in the Web services space. Whenever there are multiple activities in the same technical space, there is a danger that they will overlap and compete. And if that happens, a likely result is confusion in the marketplace, and everybody loses."

Not Taking Sides

Now it will apparently fall to companies such as Oracle, BEA, SAP and Sun Microsystems Inc. to monitor the two groups and make sure their work is complementary. Those are some of the vendors that have indicated their intention to sit on both the W3C's choreography working group and the OASIS technical committee for BPEL4WS, which will hold its first meeting May 16.

"Sun is going to try to take the high road here. We're going to try to find alignment between these two efforts. At the end of the day, the industry needs only one specification for Web services choreography," said Ed Julson, Sun's group manager of Web services standards and technologies. Sun worked with BEA, SAP and Intalio Inc. on WSCI, which Julson said "has more similarities than differences" with BPEL.

Representatives from IBM and Microsoft said last week that they have no plans to act on invitations to join the W3C's choreography working group. Steven VanRoekel, Web services marketing director at Microsoft, said the company might join the W3C group at a later date.

But VanRoekel also said Microsoft feels that Billerica, Mass.-based OASIS is a good place for higher-level specifications such as BPEL. He said the W3C typically handles lower-, plumbing-level standards such as XML and SOAP. He also noted that the scope of the W3C's choreography group is broader than that of the BPEL committee.

Karla Norsworthy, who takes an active role in standards work as the director of dynamic e-business technologies at IBM, said her company won't participate in both the OASIS and W3C groups because its "first focus is on BPEL." She didn't rule out the possibility that the decision could be revisited, however.

Norsworthy added that it will take hard work to make sure there is a single standard that every vendor implements, and she noted that BEA, SAP, Oracle and other companies will participate in both the OASIS and W3C groups that deal with the topic.

"They're definitely putting the burden on someone else to fix the problem they're creating," said Eric Newcomer, chief technology officer at Iona Technologies PLC in Dublin.

Newcomer, who serves as editor of the W3C's Web services architecture working group, said his company is "definitely disappointed about this sign of fragmentation in the community."

He said threats of divergence have surfaced before, but this marks the first time an "explicitly overlapping" charter was set up in an area where a working group was already established.

Web Services Choreography Interface

- W3C working group was created in **January 2003**
- **Chairs:** Oracle, Enigmatec
- **First meeting:** March 13-14
- **43 members,** including BEA, Cisco, Computer Associates, EDS, Hewlett-Packard, Novell, SAP and Sun

Business Process Execution Language For Web Services

- OASIS technical committee was created in **April 2003**
- **Chairs:** IBM, Microsoft
- **First meeting:** May 16
- **Members include** BEA, EDS, NEC, Novell, Oracle, SAP, Sun and Sybase

IBM Expands Grid Computing Offerings

But it doesn't expect big demand until standards are set

BY PATRICK THIBODEAU

IBM last week expanded its industry-specific grid computing offerings, even while it acknowledged that widespread adoption of grid technology won't accelerate until standards work is complete.

The Global Grid Forum in Argonne, Ill., which is developing grid specifications, is about a year away from producing enough of them to simplify development work. The standards are intended to provide developers with the basic plumbing of a grid environment, such as a common way for applications to discover what resources are available on a network and the protocols to access them.

Commercial Potential

Early grid-computing use has been in technical areas, such as science and engineering. But commercial adoptions are coming.

One early adopter is David Dibble, executive vice president at Charles Schwab & Co.'s technology service. He has been testing an IBM grid on an application that advises clients on investment strategies. The forecaster operates as a giant simulator. By using grid processes, San Francisco-based Schwab has been able to reduce a 15-minute computational process to a few seconds.

Based on his experience, Dibble said he's convinced that grid approaches will be widely adopted. "I believe the future will be networked-based computing," he said. "The days of one application owning a box . . . are gone. Companies have got to face up to the new business reality that a dollar has to go much further today than it ever did in the past."

Dibble said he expects grid computing to reduce costs, especially for hardware. "There's no question about it — huge savings through better utilization," he said. He noted that he sees little risk in implementing grid processes before standards are complete because he insists that whatever his vendors move to production is based on open standards.

The intent of grid computing is to harness unused computing power that's available in mainframes, servers and desktops and apply it in supercomputerlike fashion to computing problems.

"If you look at server utilization in an enterprise, there is a lot of untapped potential," said Dan Powers, IBM's vice president for grid computing. "Windows desktops and servers are used anywhere between 5% and 10% of the time over a 24-hour period; Unix servers are [used] anywhere between 10% and 20%" over that same period, he said.

Grid Focus

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- Higher education

Powers noted that he believes interest in grid computing will accelerate once standards work is completed.

Charlie Catlett, head of the Global Grid Forum, said one thing standards will accomplish is increasing the number of grid-enabled applications by lowering the barrier to entry, especially for smaller companies. Without standards, companies have to write "soup-to-nuts solutions" to make them work, Catlett said.

BRIEFS

Oracle Patches DB Security Hole

Oracle Corp. released a software patch for a security vulnerability that affects its Oracle8i and Oracle9i databases. Attackers could use the buffer overflow flaw to compromise data or take control of servers, the company said. Systems would have to be connected directly to the Internet without firewall protection to be attacked, Oracle noted.

Microsoft Issues Security Guides

Microsoft Corp. released a guide that's designed to help systems administrators secure computers running its new Windows Server 2003 operating system. The company also reissued a similar document for Windows 2000. The guides provide instructions on how to securely set up the two operating systems and mitigate various attacks, Microsoft officials said. Both can be downloaded from the company's Web site.

IBM Denies SCO's Charges

In a filing submitted to the U.S. District Court in Utah, IBM denied trade-secret theft allegations lodged against it in March by The SCO Group. IBM said it "has not engaged in any wrongdoing" or breached its Unix technology licensing contract with SCO. Lindon, Utah-based SCO claimed in its lawsuit that IBM was illegally using Unix code as part of its Linux services business.

Server Sales Rise, Handhelds Decline

Worldwide server shipments rose 10% year over year in the first quarter, reaching a total of 1.2 million systems, according to Dataquest Inc. But San Jose-based Dataquest said shipments of handheld devices fell 11% in the quarter to 2.8 million units.

MARK HALL ▪ ON THE MARK

Storage Vendors' Wild West Mentality...

... is working against users' interests when it comes to interoperability standards, rails Jon William Toigo, consultant, author, columnist and, starting tomorrow, founder and acting chairman of the Data Management Institute (DMI). Efforts by groups like the Storage Networking Industry Association to create workable standards are hampered by **vendors constantly taking potshots at each other** for competitive advantage, which is why the DMI is needed, he argues. Toigo says his group won't accept vendors as members, "although if they want to subscribe to a newsletter or buy a white paper, I don't care." The DMI will also evaluate vendor interoperability claims by testing their gear inside user data centers, then publish the results, Toigo says. He believes those published results **will likely bring on vendor lawsuits**, which is why he has located he DMI in his hometown of Dunedin, Fla. Florida, he says, has an anti-nuisance-lawsuit statute, which should shield him from vendors' lawyers. The commute isn't so bad, either. ▪ Tony Barbagallo, VP of worldwide marketing for backup software provider Dantz Development Corp. in Orinda, Calif., agrees that the DMI confronts "a huge issue in storage resource management." But he thinks its charter won't affect his end of the storage industry, where operating system monopolies — uh, that is, OS standards — matter most. "We follow the APIs," he says. That's why tomorrow the company will release Dantz Retrospect 6.5 for Microsoft Windows. The upgrade backs up files faster because it streams multiple backup sessions to multiple tapes simultaneously. It's designed to **back up Microsoft Exchange at the mailbox level** and to be fully compatible with the .Net functions in Windows Server 2003. ▪ Speaking of .Net brings to mind Web services and **how they're catching on – albeit, in small ways first with** more complex services coming in time. That's the strategy of Wayne Aiello, VP of e-business services at Corporate Express Inc. The Broomfield, Colo., office products company handles about 30,000 online orders per day. While individual orders are pretty small, only about $150, they **add up to more than $1 billion a year for the company.** Aiello doesn't think EDI is "less capable than XML," but all the B2B action between Corporate Express and its customers is in emerging Web services. Initially, Corporate Express leaned on its integrator, The Ultimate Software Consultants in Lombard, Ill., to set up XML-based data exchanges between its Oracle back-end systems and the 25 different customer applications. Now, after some intensive training, Aiello's team is integrating eight to 10 companies per month on its own. The next phase for Corporate Express will include **SOAP interactions that will enable customers** to generate purchase orders from their systems based on data coming from Corporate Express. ▪ As Web services-based applications get more complex, tools such as Ultimus Web Services, which will be released today as part of the Ultimus Workflow Suite, will become all the rage. But Ultimus Inc.'s CEO, Rashid Khan, thinks Web services **"will take another two to five years to really catch on."** Still, the Cary, N.C., vendor is shipping its new tool now with advanced business process management features and says the software runs on any .Net-capable Windows server. ▪ One of the few bright spots in the **dim IT marketplace today** is Wi-Fi. (See Special Report, page 27.) That's why InfoVista Corp. in New York will release on May 15 the VistaDiscovery module for its VistaPortal product. The tool is design to automatically detect wireless devices and access points on your network, so you can manage them through the Vista Operations Center. And a new Wi-Fi VistaViewer tallies authentication attempts to your wireless network, **giving you an inkling that your network may be breached by bad guys.** ◗

Tool, Telco and Teros

Next week, Parasoft in Monrovia, Calif., releases its Test.Net 1.0. The programming tool analyzes the code of the different .Net component assemblies and reports on coding errors. Pricing starts at $3,495.

Delphi Solutions Corp. in Markham, Ontario, rolls out its bundled telephone and Internet access service, Every Minute Counts, in Canada this week. Later in the U.S.

Teros in Santa Clara, Calif., today is picking up $12 million in venture capital so it can buy other security firms.

High-Tech CEOs Confront New Reality

BY LINDA ROSENCRANCE

The high-tech industry is facing a new reality of stiff competition, economic uncertainty and global instability, all of which have CEOs zeroing in on the bottom line, according to a survey being released tomorrow.

The survey, conducted during the first quarter by the Technology, Media & Telecommunications Group of San Jose-based Deloitte & Touche LLP, was directed at CEOs of the 500 fastest-growing technology companies in North America. The survey found that although CEOs are optimistic about the future, they recognize that a fundamental shift in the marketplace has occurred.

But there's an opportunity to take advantage of shortsightedness in the market by paying more attention to undervalued assets, technologies, skills and individuals, and applying them to create truly valuable offerings, said Ryan McDonald, CEO at Impact Blue Inc. in Calgary, Alberta. The trick, he said, is to do it now while the competition is either struggling or waiting for change.

McDonald said his company's primary efforts to deal with this new reality include reducing senior management staff, narrowing research and development efforts, improving cash management and optimizing production.

Russ Hawkins, CEO of Paragon Networks in Brookfield, Conn., said one of the ways his company is handling the downturn is by looking to acquire new products rather than enduring the risk and time to build everything. He said that although some internal development is still being done, the focus is on acquiring proven products.

John Fish, CEO of Chicago-based Hubbard One, said his company doesn't view its bottom line as a target. "In any economic climate, we believe the focus must be on your customers," he said. "We operate carefully, and we focus on our clients. That simple strategy has worked wonders for us." ◗

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CA Joins Push to Support On-Demand Computing

Unicenter tools the latest to enter fray

BY MATT HAMBLEN
LAS VEGAS

COMPUTER Associates International Inc. last week grouped together six Unicenter management software tools in a bid to give users on-demand computing capabilities without requiring them to make expensive upgrades to IT infrastructures.

At the Networld+Interop conference here, CA announced two new products and four upgraded ones that it said can support on-demand, or autonomic, computing applications. Companies can buy the tools separately and use them to designate servers and network devices to run critical applications and reallocate computing resources as business needs change, CA said.

CA is the latest in a string of vendors to offer on-demand technology. But CEO Sanjay Kumar said the Unicenter tools will work with systems from a variety of other vendors, so users won't have to tear out existing hardware to add on-demand capabilities.

CSX Technology Inc. wants to eliminate some of the hundreds of servers it has installed at facilities throughout the U.S., partly because the systems are hard to provision, said Cynthia Luman, vice president of operations at the Jacksonville, Fla.-based IT division of CSX Corp.

In addition, many of the servers are used at only 15% of their processing capacity, Luman said. But some systems running Oracle financial applications are commonly overburdened, resulting in "agonizing delays, like two hours to order a pad of paper," she added. CSX officials hope the Unicenter tools will let them allocate resources more evenly across different servers and lower the number of systems needed, Luman said.

Increasing Efficiency

AXA Group, a Paris-based financial services conglomerate, is looking at using CA's tools to manage a complex IT environment that supports various operating companies. Charlie Carroll, a senior vice president at the company's AXA Tech division, said the software should let AXA bill individual business units for their system usage instead of just averaging IT costs across all operations. "It would be pay-by-the-drink," he said.

Another new function is designed to provide more efficient desktop PC upgrades, a capability that the Walter Reed Army Medical Center in Washington is evaluating. In some cases, Walter Reed needs to upgrade 1,200 PCs in three days. Management tools that can track the software configurations on systems and centrally distribute new ones would simplify the upgrades, said Jeffrey Goldberg, a senior management specialist at Washington-based Management Solutions & Systems Inc., which does contract work for Walter Reed.

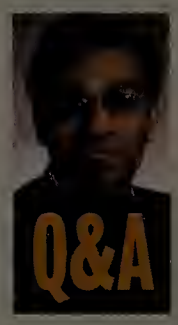
The market for on-demand computing software is heating up, said Rick Sturm, an analyst at Enterprise Management Associates Inc. in Boulder, Colo. Other vendors with autonomic computing initiatives include IBM, Hewlett-Packard Co., Microsoft Corp. and Sun Microsystems Inc. But CA should have an advantage because its tools deal with a wider range of issues and are hardware-neutral, Sturm said. ◗

PRODUCT NEWS

CA's on-demand tools: For a chart listing CA's products, visit our Web site:
QuickLink a3130

Fast switches: Two vendors announced 10 Gigabit Ethernet switches at N+I:
QuickLink 38174
www.computerworld.com

Gupta Says 'Optimal Utilization' Of Resources Goal of New Tools



Yogesh Gupta, CA's chief technology officer, spoke with *Computerworld*'s Matt Hamblen at N+I about the vendor's on-demand computing strategy.

What is new about these Unicenter tools, and how does CA define on-demand computing? Really, one of the big issues that comes up is that customers have large numbers of servers that are underutilized. That means there's tremendous opportunity if work can be done to use those servers better. What the six products work together to do is identify and keep track of resources at any given point in time.

Why not market them as a unified suite? They're sold as separate products so customers can license one or more. We decided to sell separate products within Unicenter two years ago, and it has worked well. But all these pieces work well together.

Is the software really self-healing? When a server fails, we try to bring it [back] online, and if we can't, the software will automatically allocate a different server to do the work. But it's more than self-healing. It's optimal utilization of networks and systems.

Are you late with on-demand computing compared with IBM and other vendors? If you want to talk about the rhetoric, we're definitely late with the rhetoric – but first with real products. We made a conscious decision we would not talk about autonomic computing until the day we had products.

READ MORE ONLINE

For an expanded version of this interview, head to our Web site:
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Borland to Launch Tools for Microsoft's .Net Framework

BY CAROL SLIWA

Developers will gain new options for building applications designed to run on Microsoft Corp.'s .Net Framework and connecting those applications to systems in Java environments when Borland Software Corp. ships new products starting next month.

The Scotts Valley, Calif.-based software maker tomorrow plans to announce its C# Builder integrated development environment, which is intended to let developers make use of the .Net Framework's class libraries.

The Borland tool, due this summer, will feature design-driven development capabilities and native support for databases from Microsoft, Oracle Corp. and IBM, as well as Borland's own InterBase.

Also tomorrow, Borland will announce a new product called Janeva that's designed enable client- and server-based applications written for Microsoft's .Net Framework to integrate with back-office systems through the Internet Inter-ORB Protocol (IIOP). Due in June, Janeva is based on J2EE and Common Object Request Broker Architecture (CORBA) technologies.

PRICE TAG

C# Builder

- Architect
- Enterprise
- Professional
- Personal

Boz Elloy, vice president and general manager of Borland's enterprise business unit, said the difference between using Janeva and using Web services or bridge technology is that Janeva requires no additional investment.

"We want to make sure we're not requiring .Net developers to use any new technology," he said. "We also don't want to require any modifications to back-end logic."

Thomas Murphy, an analyst at Stamford, Conn.-based Meta Group Inc., added that the IIOP option may be better when performance is an issue. He also said Janeva will be important for users with existing CORBA investments.

Janeva will support all languages that run on Microsoft's .Net Framework, including C#, J#, Visual Basic .Net and Delphi, according to Borland.

Simon Thornhill, vice president and general manager of Borland's .Net business unit, said the development aspects of Janeva will be incorporated into C# Builder. The product will provide some support for Visual Basic .Net, and Borland plans to add other languages in the future, said Thornhill.

Borland will also announce tomorrow Enterprise Server, Team Edition, a J2EE deployment platform for small and midsize businesses and departments in large companies, said Elloy. Due in early June, it's priced at $1,995 per CPU. ◗

SCALE-UP PERFORMANCE

Transaction Processing Performance Council

TPC

Top TPC-C Performance Results for Non-Clustered Systems

Rank	Database	System	Performance (tpmC)	($/tpmC)	System Avail.
1	**Microsoft SQL Server 2000 Enterprise Ed. 64-bit (Windows Server 2003)**	HP Superdome	658,277	9.80 US $	10/23/03
2	**Microsoft SQL Server 2000 Enterprise Ed. 64-bit (Windows Server 2003)**	NEC Express 5800/1320Xc	514,034	11.50 US $	10/22/03
3	**Fujitsu**	PRIMEPOWER 2000 c/s w 66 Front-Ends	455,818	28.58 US $	2/28/02

let's look into this -JG

Source: Transaction Processing Performance Council benchmark tests as of 4/24/03

Page 1 of 2

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Page 4

The facts tell a compelling story. Microsoft SQL Server™ 2000 is the new worldwide leader in scale-up server performance, achieving the top two rankings in the latest TPC-C benchmark tests. To learn how SQL Server 2000 can quickly increase your scalability, visit microsoft.com/sql/tpc **Software for the Agile Business.**

Microsoft

IBM Readies Storage Virtualization Tools

SAN appliance due in July, Storage Tank file server technology in December

BY LUCAS MEARIAN

IBM last week said it plans to ship this summer its first storage-area network (SAN) virtualization device for block-level data and to add by year's end another product, based on its Storage Tank technology, that will provide a common file system for multivendor disk array installations.

The TotalStorage SAN File System device, due in December, will combine the Storage Tank virtualization software with specialized Linux-based versions of the company's xSeries servers. IBM said it will also release a development specification that will make it possible for other vendors to link storage subsystems on application servers to the SAN File System.

IBM detailed a three-phase plan for delivering storage virtualization technology, starting with an appliance that will initially support only its own disk arrays (see box). But the Storage Tank-based device is the centerpiece of the virtualization strategy.

A Long Wait

Brian Swick, supervisor of storage administration at The Regence Group Inc., a health maintenance organization in Portland, Ore., said he has been waiting for Storage Tank for about three years. Swick said he hopes the technology can help him better utilize disk space and reduce overall costs on his 125TB SAN, which is split equally between IBM and EMC Corp. arrays.

Currently, Swick uses half of the capacity on his EMC Clariion arrays for primary storage and the other half to back up Regence Group's Sybase Inc. databases. With Storage Tank's shared file system, Swick said, he could use IBM's Tivoli Storage Manager software to directly archive data on tapes, eliminating the need for the disk-based backups.

On the other hand, Jack Malinsky, director of operational technology for the city of Boston, said he has little use for virtualization technology because he likes to assign specific disk arrays to specific applications. That makes for a "much cleaner" storage architecture, said Malinsky, who uses a mix of IBM Shark and EMC Symmetrix arrays.

IBM has been talking up Storage Tank for the past four years, saying the SAN-based file system is designed to enable multiple application servers to access and share files in a single name space across multiple disk arrays.

More Work Needed

But Jamie Gruener, an analyst at The Yankee Group in Boston, said IBM needs to take several more steps before it can claim to offer a well-rounded set of SAN virtualization products. For example, the company must get its block-level virtualization software to work on rival arrays and make the technology available on SAN switches, Gruener said.

Brian Truskowski, general manager of IBM's Storage Systems Group, said that by year's end, the new TotalStorage SAN Volume Controller appliance will be able to work across all disk arrays made by major vendors. The company eventually hopes to port the block-level virtualization code to switches made by Brocade Communication Systems Inc. or Cisco Systems Inc. for greater SAN flexibility, added Truskowski.

Swick said the switch support could help save money for Regence Group by enabling him to buy low-cost disk drives and use them to support multiple applications, no matter what kind of arrays the systems initially used.

"The challenge we're running into right now is that a particular [application] server can only be on IBM or EMC," Swick said. ◗

IBM's Virtualization Rollout Plan

JULY A Linux-based SAN volume controller that's initially designed to pool storage capacity on the company's Shark and FAStT disk arrays

AUGUST A packaged system that combines the volume controller with an 83TB FAStT600 array and redundant Fibre Channel switches.

DECEMBER A Linux-based system that uses IBM's Storage Tank virtualization software to centrally manage files across multivendor SANs

EMC Plans Windows-based Storage

BY LUCAS MEARIAN

EMC Corp. last week announced licensing agreements with Microsoft Corp. that will enable the storage vendor's first foray into the market for low-end network-attached storage (NAS) devices.

EMC said it plans to run Microsoft's Windows Powered NAS software on its Clariion CX midrange disk arrays. An initial product, the NetWin 200, will be based on the entry-level Clariion CX200 hardware and is due in October. It will be priced from $50,000 to $130,000 and store between 1.1TB and 4.4TB of data.

In comparison, Hopkinton, Mass.-based EMC charges a starting price of $167,000 for a 1TB model of its higher-end Celerra NS600 storage device, which uses NAS software the company developed internally.

EMC also said it will use the storage application programming interfaces (API) built into Microsoft's Windows Server 2003 operating system to enable centralized management of both the NetWin 200 and Celerra from a single console. In addition, EMC plans to integrate its ControlCenter storage management software with Windows-based systems via the Microsoft APIs.

Bill North, an analyst at IDC in Framingham, Mass., said the deal with Microsoft will let EMC users store NAS data on mainstream disk array hardware. They will also be able to manage both types of storage "without having to launch another set of tools," he added.

Jeff Cohen, CIO at discount airline JetBlue Airways Corp. in Forest Hills, N.Y., said he's primarily interested in the API aspects of the agreement between EMC and Microsoft. That could give IT workers at JetBlue a more unified view of the company's server and storage environment, he said.

Easier to Run

"Anytime you can consolidate management consoles into one view, it makes things easier to run," Cohen noted. JetBlue is expanding its 15TB storage-area network to include a third model of EMC's high-end Symmetrix array, he said. Meanwhile, the airline is running Windows Server 2003 on about 250 of Hewlett-Packard Co.'s ProLiant servers, plus Unisys Corp.'s high-end ES7000 systems.

Since Microsoft released Windows Powered NAS two years ago, IBM, HP and Dell Computer Corp. have all pushed to sell low-end appliances based on the software. But until now, EMC had relied on its own NAS technology.

A spokesman for Dell, which resells EMC's Clariion arrays, said the computer maker doesn't plan to market the NetWin 200. But he added that the new EMC device shouldn't conflict with Dell's own PowerVault NAS product line, which starts at under $25,000 and is primarily aimed at lower-end uses than the NetWin 200 is.

Windows Server 2003, which was officially released April 24, includes a number of new storage features, such as a Virtual Disk Service technology that provides storage vendors with a set of APIs for interoperating with servers running the operating system.

Microsoft also announced its Volume Shadow Copy Service, which lets users create "snapshots" of information for data recovery purposes. In addition, it plans to support the iSCSI protocol, which lets users transmit data over IP networks. Zane Adam, product management and marketing director for Microsoft's storage unit, said a free download of the iSCSI software is due next month. ◗

OTHER DEVELOPMENTS

EMC

- Has signed a letter of intent to resell Cisco's MDS 9000 SAN directors and switches and to develop software that will run on the devices.
- Is upgrading its PowerPath I/O channel management software by adding new features such as support for disk arrays made by other vendors.

DATA RECOVERY

Storage Technology Corp. is announcing a device for use in restoring corrupted data:

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BRIEFS

IBM, HP Release Itanium 2 Systems

IBM released its first server based on Intel Corp.'s 64-bit Itanium 2 processor. The eServer x450 is designed for use in data analysis and technical computing applications. It supports up to four CPUs and can run Windows Server 2003 or Linux. Prices start at $25,999. Meanwhile, Hewlett-Packard Co. announced two Itanium 2-based workstations that run the 64-bit version of Windows XP.

Nortel, Redback Settle Lawsuits

Nortel Networks Ltd. and San Jose-based Redback Networks Inc. have agreed to settle dueling lawsuits that were filed in late 2001 regarding five U.S. patents held by Nortel. The settlement includes a patent cross-licensing agreement under which Redback will pay Nortel an undisclosed fee, the two companies said.

Ericsson to Slash Nearly 14,000 Jobs

After posting a $504 million first-quarter loss, LM Ericsson Telephone Co. announced plans to cut nearly 14,000 jobs by September 2004. The Stockholm-based company said its workforce will shrink from 61,000 people to 52,000 by the end of this year and then drop to 47,000 by the start of next year's fourth quarter.

Short Takes

VITRIA TECHNOLOGY INC., a Sunnyvale, Calif.-based vendor of business-process integration tools, reported a $20.7 million first-quarter loss on revenue of $22.6 million. Vitria also said its stock faces possible delisting by Nasdaq. . . . San Diego-based PEREGRINE SYSTEMS INC. said it filed a new version of its proposed financial restructuring plan with the U.S. Bankruptcy Court in Wilmington, Del.

Disparate Views of IT Governance Spark Debate

Panelists weigh IT centralization vs. decentralization

BY THOMAS HOFFMAN
CAMBRIDGE, MASS.

CIOs and consultants who took part in a panel discussion last week about the best way to develop and foster IT governance models were deeply divided over which path companies should take.

IT governance — a methodology for keeping technology spending and labor costs under control — has become a hot topic among CIOs and IT managers in recent months. Interest has largely been driven by the increased emphasis on overall corporate governance in the wake of the Enron scandal and the emergence of more stringent accounting requirements, as well as the continuing cost pressures IT leaders are facing.

But there is no cookie-cutter approach to IT governance, said Rob Austin, a fellow at Cutter Consortium in Arlington, Mass., and a professor at Harvard Business School. Austin was one of four panelists who debated IT governance issues at Cutter's Summit 2003 conference here.

Lynne Ellyn, CIO at DTE Energy Co. in Detroit, backed up his point. "There are many companies that have effective IT governance models that I have no interest in," Ellyn said.

Two years ago, DTE created an IT steering committee that includes Ellyn and various business executives. Business unit leaders at the diversified energy company decide which IT projects need to be launched, "and IT decides how they get done," she said.

It took a full year for DTE's IT steering committee "to work effectively together," Ellyn noted. But since the committee was formed, DTE's IT department has reduced its budget by 40% while increasing productivity and end-user satisfaction rates, she said.

Facing Financial Pressure

In the 18 months since Craig Fowler joined Corning Cable Systems as CIO, the Corning Inc. unit's annual revenue has dropped by nearly 60% as a result of the telecommunications industry bust. To reduce spending, Fowler has focused on centralizing IT functions at the Hickory, N.C.-based maker of fiber-optic and copper communications systems.

"We think we can get more costs out this way," Fowler said. Previously, each business unit had a dedicated IT organization "and did their own deals on PCs," he said. "By centralizing, we're trying to increase our IT buying leverage while helping us determine what [systems] we have in place." Thus far, Corning Cable has reduced both its IT staff and IT budget by more than half, Fowler added.

Christine Davis, president of Crishele Consulting in Manhattan Beach, Calif., and a fellow on Cutter's Business Technology Council, said she supports a decentralized approach to managing IT. But she also championed the use of IT governance best practices taken from other companies. That position drew sharp rebukes.

"Benchmarking, at best, will show you how well your competitors were performing the last time a benchmarking test was done," Ellyn said. "You have to have the courage to do something beyond best practices." ▶

IT Governance Recommendations

- Include a **steering committee of senior IT and business executives** to decide on companywide IT priorities and investments.
- Set up self-directed work teams **made up of IT staffers and business-unit liaisons** to manage individual projects.
- Establish boundaries that **specify what kind of decisions** the work teams can and can't make.
- Form an architectural council that **sets corporate IT standards,** plus more targeted groups such as an IT security council.

SOURCE: CHRISTINE DAVIS, PRESIDENT, CRISHELE CONSULTING, MANHATTAN BEACH, CALIF.

GET INVOLVED

Conference attendees discuss ways to give IT a more proactive role inside companies:
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Senior Execs Looking for Business-savvy IT Managers

Stress need for familiarity with business plans

BY LUCAS MEARIAN
BOSTON

Business executives from a group of financial services firms last week shared a basic idea about how CIOs can deliver returns on IT projects: For starters, they said, IT managers have to be able to read an income statement.

"Do you know where the revenue comes from? Do you know where expenses are generated? And do you understand you have to have more of the first and less of the second?" asked George Fisher, executive vice president and chief administrative officer at New York-based Prudential Securities Inc.

Fisher and three other executives participated in a panel discussion about what they want to get from their IT departments, as part of the National Investment Company Service Association's annual technology conference here.

Most of the panelists said IT managers are expected to be an integral part of their business operations and, as such, should be as well versed in business plans as they are in technology.

"When you have your major technology folks . . . able to discuss in great detail and very accurately describe, define and discuss what the business challenges are to doing something, then you know you're beginning to blend your organization," said William Bridy, a senior director at New York-based Merrill Lynch Financial Data Services Inc.

> **"We want to have [IT] functionality delivered as needed.**
>
> WILLIAM BRIDY, SENIOR DIRECTOR, MERRILL LYNCH FINANCIAL DATA SERVICES INC.

Bridy and other participants also said they have bid farewell to the practice of funding long-term IT projects. Now they expect quarterly progress reports on projects and want to see tangible returns on investment in a maximum of 18 months.

"We want to have functionality delivered as needed," Bridy said. "If it's a longer-term initiative, let's break it down into manageable, controllable and discrete chunks."

Fisher said he advocates that most IT projects should pay for themselves within a year. "A lot of people put out multiyear projects, and then a couple of years later, nobody knocks on their door and asks them, 'Did it work?' " he noted.

On the other hand, Bridy said he has found that most IT problems or project failures can be traced back to business users not clearly defining their goals. But neither he nor the other panelists discussed that issue further. ▶

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Group Touts Vermont as Outsourcing Alternative

Wages higher than India's, but lower than in U.S. cities

BY PATRICK THIBODEAU

INFORMATION technology consultant Seamus Walsh was working in lower Manhattan on Sept. 11, 2001. What happened on that day prompted him to move his family to the relative tranquility of Vermont.

Now based in South Burlington, Walsh is organizing a consortium of independent IT firms and consultants to try to convince the big-city firms he left behind that bucolic Vermont is a viable alternative to countries overseas for software development.

Vermont's IT labor rates, at $35 to $50 per hour, are two to two and half times the hourly rates in India. But they're lower than the rates in U.S. urban areas, where IT labor costs $80 or more per hour Walsh said.

The idea of attracting IT work to rural areas makes sense if labor rates are significantly lower than those in metropolitan areas and if there are enough workers with the right skills, said Rita Terdiman, an outsourcing analyst at Gartner Inc. in Stamford, Conn. Terdiman said she believes that initiatives like the one in Vermont will spring up in other parts of the country. "I think you are going to absolutely see a trend toward that," she said.

The biggest problem facing Vermont may be just across the border: Canada's favorable currency exchange rate.

Richard Nolle, vice president of systems at Reinsurance Group of America Inc., said the idea of lower-cost areas in the U.S. developing into alternative development centers sounds "remotely possible." But he said it will be difficult for U.S. competitors to overcome the Canadian exchange rate.

Nolle's Chesterfield, Mo.-based company outsources application development work in Canada and intends to expand its use of workers in that country. The exchange rate saves the U.S. company approximately 30%, Nolle said.

CenterBeam Inc., a Santa Clara, Calif.-based company that manages computing resources for small and midsize companies, intends to open a major center in Saint John, New Brunswick, later this year. CEO Kevin Francis said he can hire three Microsoft certified engineers in Canada for roughly the cost of one in the U.S.

But one Vermont outfit is drawing development work from urban customers. A not-for-profit affiliated with a Burlington-based college, eSolutions@ChamplainCollege has eight employees who offer high quality at rates that are roughly 25% lower than in urban areas, said David Binch, the company's director.

Burlington is also trying to overcome telecommunications infrastructure disadvantages faced by many locations outside of large metropolitan areas. The city has installed more than 18 miles of fiber that can support 100Mbit/sec. connections to link about 40 sites, including schools and municipal buildings. "There is no question that first-class telecom is a significant factor in location decisions," said Timothy Nulty, head of Burlington's telecommunications project. ◗

Meanwhile, in New Jersey . . .

... the state legislature recently approved a bill that would limit government contracts to U.S. citizens and legal aliens. A push for similar federal laws may not be far behind.

POLICY: Federal government contractors aren't generally prohibited from sending IT work to offshore developers, but they can be specifically barred from doing so by contract.

SCOPE: The feds awarded about $19.4 billion in IT contracts last year. Figures on how much of that work went offshore aren't available.

SARS Affects Travel but Not Outsourcing

An IT outsourcing conference scheduled to be held in Shanghai in June has been postponed, with its organizers hoping to reschedule in October. It's a direct consequence of the SARS virus that has disrupted some Asian economies but otherwise seems to be having little impact on offshore development.

The outbreak of SARS, or severe acute respiratory syndrome, as well as the war in Iraq may have hurt earnings posted recently by some large outsourcing providers based in India, Gartner Inc. said last week. But Gartner said earnings may have also been affected by rupee appreciation, increasing salaries and competition.

U.S.-based outsourcers said the impact of SARS is limited. It is affecting travel, with business travelers favoring routes to India that take them through Europe, bypassing Asian hubs.

But China, the country most seriously affected by SARS, isn't yet a major outsourcing market.

Kumar Mahadeva, CEO of Teaneck, N.J.-based Cognizant Technology Solutions Corp., said China has significant issues to address. For example, before companies outsource to China, they would want to make sure that the country provides intellectual property protection and that the workforce supplies the right skills. Project managers, in particular, "are not available locally," he said. But once those issues and others, such as the need for telecommunications improvements, are addressed, China could emerge as a major offshore outsourcing center.

Marc Hebert, a vice president at Sierra Atlantic Inc., a Fremont, Calif., company that does outsourcing in India, said that while SARS remains a wild card, he isn't expecting the virus to have much impact on work in India, even if people curtail travel. "The work will continue to flow to India," he said.

– Patrick Thibodeau

Continued from page 1

Offshore Coders

Corp. Chief Security Officer Mary Ann Davidson, one audience member said that it's "ironic that the countries the software industry trusts the least with binary code are the places where source-code development is being sent."

Davidson acknowledged that Oracle, which sells its software to all of the major U.S. intelligence agencies, does outsource some of its development work to companies in India and China. However, "we give read access, not write privileges, to developers in India," she said. "And for the work done in China, it's quality control, and they do not need source-code access to do that."

Although Davidson acknowledged that there is "a national security issue" involved in moving development work overseas, she said there is also no guarantee that a worker who is a U.S. citizen won't intentionally harm source code.

The economic situation today is such that "you can't build these products without non-U.S. citizens," said Davidson. "Whether you like it or not, our national secrets are already being preserved by people who built these parts of the core infrastructure, and they're not U.S. citizens."

> **"Like it or not, our national secrets are already being preserved by people who [aren't] U.S. citizens.**
>
> **MARY ANN DAVIDSON**, CSO, ORACLE CORP.

Assessing Risks

Tim McKnight, chief information assurance officer at Los Angeles-based Northrup Grumman Corp. and a former security officer at Cisco Systems Inc., said companies must put in place a verification and auditing process. And he said that effort will be costly.

"At Cisco, we had teams that would go overseas and verify the people that were there, monitor their access to file servers and source-code servers and do risk assessments," said McKnight. "It is very difficult to truly know who these people are. It can be done, [but] you really need buy-in from the top of the corporation."

A show of hands during the closing session of the conference indicated that the majority of attendees doubted the ability or willingness of software companies to conduct proper background investigations of foreign software coders working overseas.

That's not surprising, given that few companies in the U.S. conduct background investigations on IT personnel, said Joyce Brocaglia, CEO of Alta Associates Inc., a Flemington, N.J.-based executive search firm. "I'm surprised at how few of my clients actually do background checks on their information security professionals," she said. "At most, they require me to do a reference check." ◗

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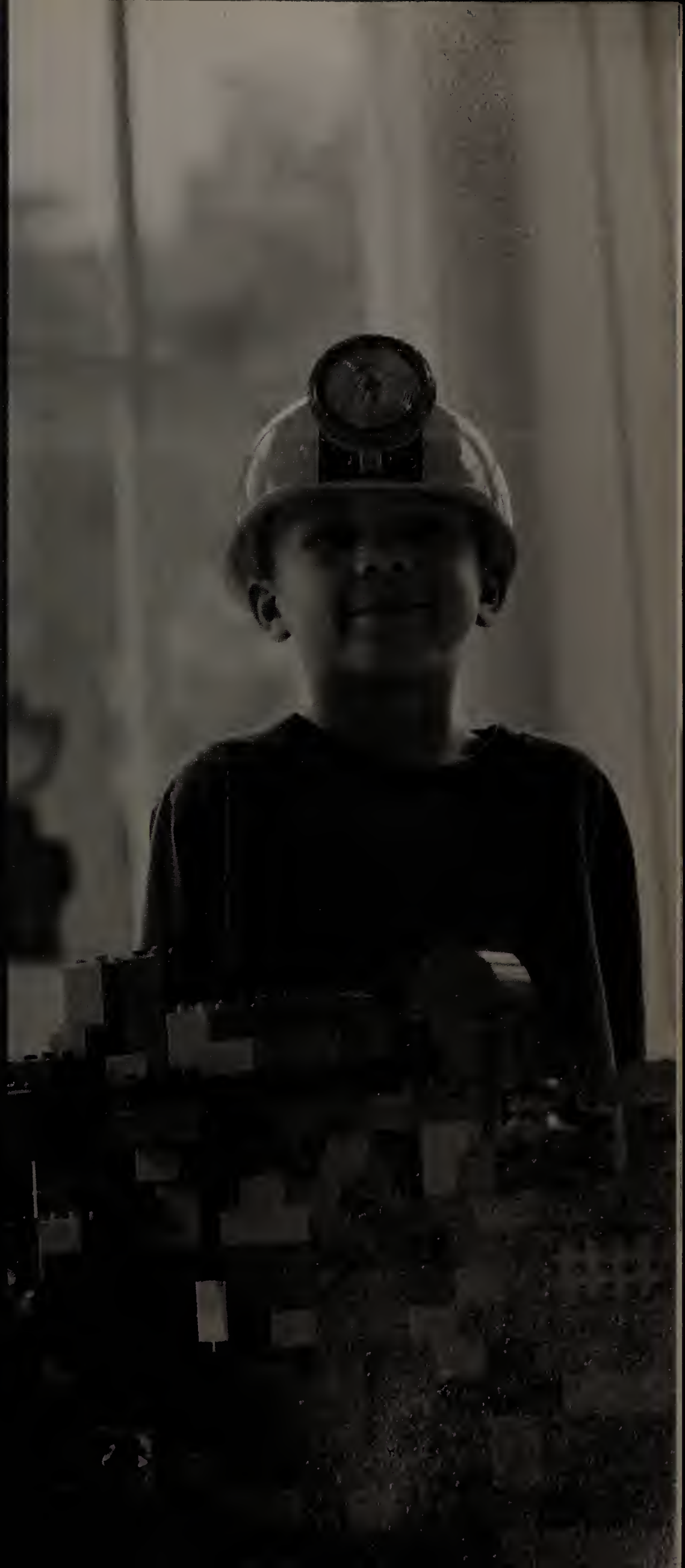

"We just migrated to Dell servers running a standards-based solution and now we're getting significantly better price/performance."

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Translation:
We're hemorrhaging cash.

"Right."

Translation:
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Tests by Dell in January 2003 on baseball database. Dell configurations: Dell PowerEdge 6650 server with four 2.0 GHz Xeon MP processors, Red Hat Linux Advanced Server 2.1, 3 Year Gold Support. Price: $32,701 (www.dell.com, 1/20/03) and Dell PowerEdge 2650 server with two 2.8 GHz Xeon DP processors, 4GB memory, Windows 2000 Server, 3 Year Gold Support. Price: $9,324 (www.dell.com, 2/10/03). Sun configuration: Sun Fire V480 server with four 900 MHz UltraSPARC III processors, Solaris 9 (12/02 version). Price: $53,796 (www.sun.com, 3/17/03), 3 Year Gold Support. For details and results, see: www.dell.com/migration.

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HIPAA Could Hamper Medical Research

BY SHARON MACHLIS

New federal privacy guidelines are making it tougher for medical researchers to access large amounts of patient data — and some researchers fear that could jeopardize studies of drug safety, medical devices and how to better predict and prevent disease.

"I think some projects are going to be much harder to do," said Dr. David Korn, a senior vice president at the Association of American Medical Colleges in Washington. Others simply won't be possible, he predicted.

The reason is HIPAA, the Health Insurance Portability and Accountability Act. Designed to give individuals more control over their personal medical information, HIPAA explicitly outlines how medical records can be given to third parties and carries stiff penalties for violations. The law's privacy provisions went into effect April 14.

PRIVACY REGULATION

"Most of what HIPAA expects is good common-sense management . . . [but] it does introduce additional levels of complexity," said Stephanie Reel, CIO and vice provost for IT at Johns Hopkins University in Baltimore. "I don't think the HIPAA legislation intended to do harm to academic medicine, but it's complicated."

The stakes are high. Research projects that mine medical data have uncovered links between smoking, diet and lack of exercise and some diseases, as well as effective prevention strategies.

Major teaching hospitals like Johns Hopkins have systems in place to manage the process of making medical data available for research under HIPAA. In addition, some ongoing large-scale research efforts, such as the Framingham Heart Study in Massachusetts, rely on volunteer participants. Although such projects must comply with HIPAA, they are unlikely to be affected by a lack of access to data about additional patients.

But researchers said they're concerned about the fate of new studies that seek to examine large population samples. Such studies typically rely on data not only from teaching hospitals, but from community hospitals, medical clinics and other facilities as well.

HIPAA does provide ways for smaller hospitals to share data with medical researchers. However, information that could be matched to individual patients must be stripped out unless permissions or waivers are granted. A third option allows more limited information-stripping under special data-use agreements.

Researchers worry that the HIPAA guidelines are so cumbersome, and the penalties for violations so steep, that many community hospitals and clinics may decide it's safer and easier to say no.

HIPAA has "increased the perceived risks" for smaller institutions to cooperate with researchers, said Dr. David Savitz, chairman of the epidemiology department at the University of North Carolina at Chapel Hill's School of Public Health.

Korn said widespread use of a standard HIPAA-compliant computerized record-keeping system could solve the problem, allowing records to be quickly "de-identified" and transmitted. But in fact, many medical records aren't computerized at all. "When you're talking about paper charts, it just is a fearsome hurdle to try to make it de-identifiable," Korn said.

Preparing records for researchers will be "very burdensome" for hospitals, according to Lawrence Hughes, regulatory counsel and director of member relations at the American Hospital Association in Chicago. However, Hughes said he has yet to hear of hospitals that are now reluctant to give up information to researchers. But Korn said he has heard anecdotal reports of hospitals either refusing to turn over records or charging fees for the data.

The Association of American Medical Colleges hopes to compile a database so it can document the effect of HIPAA on research activities. "I think it's going to be a problem," he said. "I hope it won't."

Privacy Rules Pose Hurdles for Fund-Raising

HIPAA may have an impact on medical research beyond potentially causing difficulties in accessing data. The law also affects research fund-raising procedures.

Previously, fund-raisers at Johns Hopkins could contact patients treated at, say, its Wilmer Eye Institute and ask them to contribute money to help fund research into vision problems, said Stephanie Reel, CIO and vice provost for IT at the university. "We can't do that anymore," she said.

Under HIPAA, medical institutions can no longer do targeted fund-raising without first requesting permission from patients to contact them about specific departments or treatment centers. Otherwise, fund-raising solicitations must be mailed to all patients – a more expensive and less efficient way to manage a campaign. "That makes an enormous difference to a place like Johns Hopkins," Reel said.

– *Sharon Machlis*

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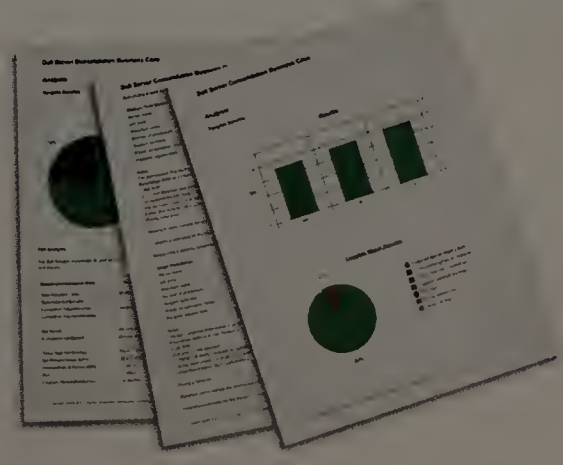

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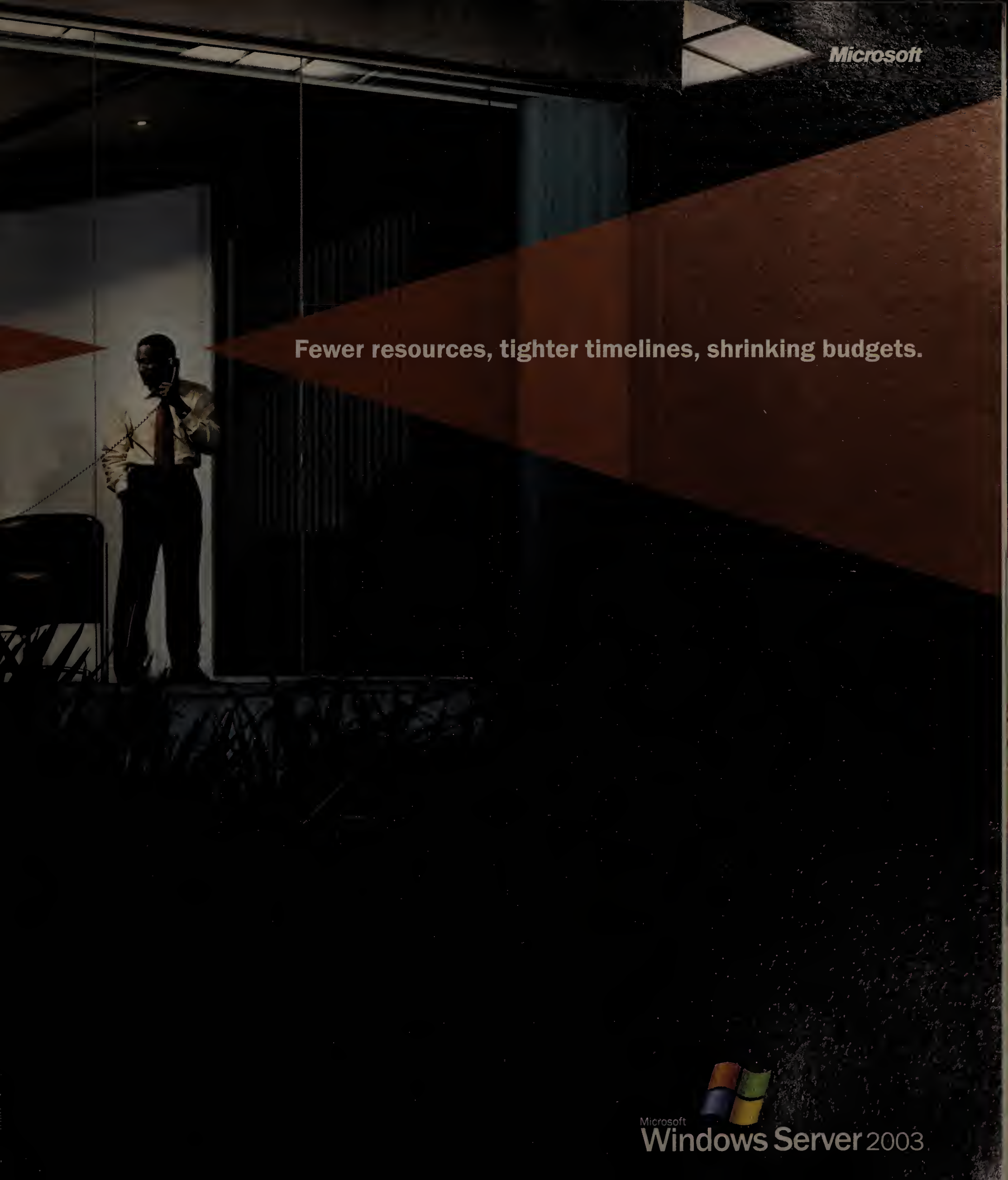
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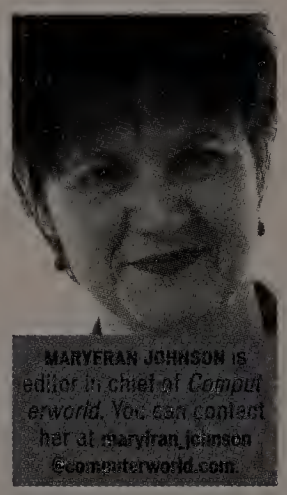
MARYFRAN JOHNSON

Worthy of Wireless

BY THE TIME I FINISHED reading the page proofs for our "Wireless at Work" special report (stories begin on page 27), I was ready to turn in my new Palm Tungsten W and confess the embarrassing truth: I'm only impersonating a real user.



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

Half the capabilities of this gorgeous gadget are wasted on me. I don't use it as a cell phone (got one already), and I don't even have the wireless connection enabled (too much e-mail would follow me around). Naturally, I use the calendar, address book, memo pad and calculator. But I am clearly not worthy of this much cutting-edge technology.

Fortunately for the wireless industry, overprovisioned editors are nobody's target market. In fact, reporter Bob Brewin found that for many companies, wireless is taking significant hold as a blue-collar technology "far removed from the world of executive BlackBerry pagers or airport lounge wireless LAN 'hot spots' " (page 38).

Once you look beyond the decaf-mocha-latte-sipping Starbucks crowd, the true impact of wireless shows up in successful working-class applications serving repair-truck drivers from Sears and bulldozer operators at a Wyoming coal mine. At Todd Shipyards in Seattle, 66 supervisors are making far better use of wireless on their Palm devices than I ever will. They're managing the time records of 1,200 union workers, enabling them to see who's working on which job. The $300,000 system had to work around the physical and geographic barriers presented by 44 acres full of metal structures, which required the installation of 33 access points, some with high-powered antennas.

For our 15-page special report, we conducted an online survey a month ago, gathering feedback from 323 users. On average, they came from companies with more than 5,000 employees and IT departments of fewer than 50. The majority (64%) consider wireless technology important to their business goals. And no wonder. The leading five business uses for wireless, our survey found, are mobile access to the enterprise, sales force communication, data entry from the field, logistics support and factory-floor data entry.

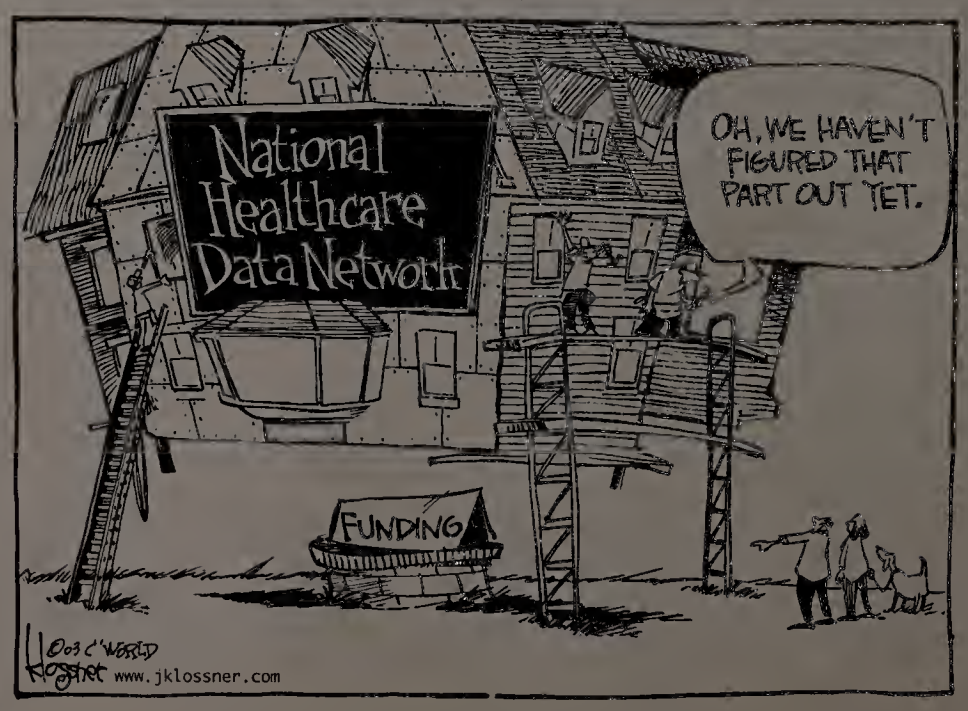
Somewhat heartening, though, is that 38% of the respondents said the economic downturn has had no impact on their wireless rollouts. That kind of determined backing of any IT project is rare these days. It underscores how quickly the payback must be happening for many companies.

The stumbling blocks of inadequate bandwidth and network availability don't appear to be stemming the steadily rising tide of companies moving forward with wireless projects. Even concerns about security aren't putting on the brakes. By the end of last year, seven in 10 companies had adopted wireless technology, according to an IDC survey of more than 1,200 North American companies across 18 industries. About $2.2 billion was spent in 2002 on wireless hardware, and that's expected to rise to $3.9 billion by 2006, says research firm In-Stat/MDR.

Also intriguing is how the small-business frontier is becoming crowded with wireless users these days (page 44). These second-generation adopters watched, learned and rolled their own, often in highly customized implementations.

"To make wireless cost-effective, the vendors have got to know an awful lot about their clients' business processes," says Gartner analyst Phillip Redman. "That's why you see so many adopters skipping a Microsoft or an IBM and going instead to specialist [vendors] in areas like transportation and warehousing."

Across so many industries, wireless is getting down to business, doing real work and proving itself worthy. Watching it all happen makes me wish I was worthy, too. ▶



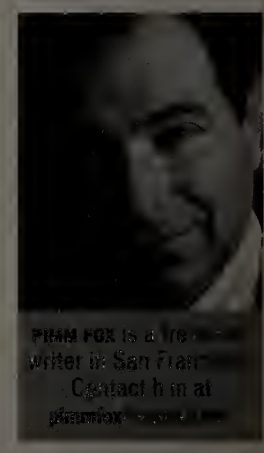
PIMM FOX

Monitoring Mom With QA Tools

CAN YOU PUT A PRICE on motherhood? Probably not. But if you're in the floral and gift business and count on Mother's Day for a sizable piece of your revenue, you can easily put a price on the uptime of the online systems that will be getting pounded by well-intentioned last-minute shoppers.

That's part of the motivation behind 1-800-Flowers.com's reliance on pre- and postproduction monitoring software.

There's an emerging trend to create quality assurance (QA) testing and monitoring scripts during the design and construction phase of an IT project and then reuse them throughout the project's life cycle. While developers are writing code, QA team members can build the load- and stress-test scripts to determine if the project is meeting requirements set by business liaison groups.



PIMM FOX is a freelance writer in San Francisco. Contact him at pfoxmail@...

In the case of Westbury, N.Y.-based 1-800-Flowers.com, which does more than 50% of its business online, this means gearing up for worst-case scenarios on Valentine's Day and Mother's Day. As code is assembled, the QA team's scripts measure the interoperability of components as they're completed. Then they test the code in real time.

At 1-800-Flowers.com, software from Sunnyvale, Calif.-based Mercury Interactive Corp. can push the system to simulate 150,000 simultaneous orders. Obviously, you'll need to create your own metrics to test for, but they should include the capture of live results, and you should also measure third-party performance if your site depends on outside services. It's no good having a service-level agreement with an Internet service provider if there's no way to verify how it's doing.

And while it's a no-brainer that 1-800-Flowers.com needs to keep the

retail front door open for customers around the clock, the supplier connection is vital to *all* businesses — retail and wholesale.

Can your business managers monitor the call center experience? Do they have a good idea of what service reps go through?

Being able to monitor back-end and internal systems is equally vital, because it lets you know whether you're getting the most out of your hardware resources or if you're suffering from the ripple effects when applications are modified.

As testing and monitoring software becomes more sophisticated — and, unfortunately, more expensive — it very likely will be billed as a tool for business optimization. That remains to be seen, but reusing scripts and developing a more prominent role for QA could help you better understand whether you're even close to a return on your IT investment.

Without it, Mom might not get her flowers and continue to think of you as her priceless child. ◗

DAVID MOSCHELLA

Blogs Bring Content Alternative

BLOGS ARE HOT NEWS. In February, Google caused a stir by acquiring Pyra, creator of Blogger.com. In the past few months, many businesses have been experimenting with blogs as a way to make their Web sites and intranets seem more current and friendly. In the wider world, politically oriented weblogs such as AndrewSullivan.com have emerged as important voices in the ongoing debate over Iraq. More poignantly, the Baghdad blogging of Salam Pax was a rare source of preliberation Iraqi candor.

Blogs deserve our attention because they're an important technological advancement. They make it possible for anyone with an Internet connection to quickly post text and images, and eventually audio and video, to the Web without any real technical knowledge. Blogs resemble e-mail in that they enable us to actively contribute to the Internet, as opposed to simply consuming it.

Over the past five years, hundreds of thousands of blogs have been developed. That the great majority of them are little more than vanity pages seen only by the creators' friends and family shouldn't turn us against the technology. Self-publishing will eventually prove to be an important Internet industry factor.

DAVID MOSCHELLA's latest book is *Customer-Driven IT: How Users Are Shaping Technology Industry Growth.* Contact him at dmoschella@earthlink.net.

But exactly how remains unclear. While there is considerable interest in corporate usage, the current enthusiasm seems a bit exaggerated. Large businesses already have the ability to regularly post content to the Web, and although blogs can make this even easier, their appeal would seem to be at least partially offset by real concerns regarding control and quality. The net increase in business empowerment is significant but relatively modest.

The biggest benefits will continue to accrue for individuals and small businesses, who are increasingly being freed from the requirements of HTML and the expensive Web professionals who understand it. Someday, all of us will post information to the Web as easily as we make PowerPoint presentations today. That's real progress. But again, the question is, Toward what end?

Many enthusiasts see individual blogs as an alternative to commercial Web content, but this still appears unlikely. Maintaining a high-quality blog takes considerable time and therefore requires sustained motivation. Self-expression and self-promotion have clearly motivated many, but they have obvious limitations. AndrewSullivan.com has had some success soliciting voluntary financial contributions, but this is a rare example.

To me, the key question is whether individual blogging can be harnessed to create something larger than any one person could develop. Consider the analogy with open-source software. No individual could compete with powerful commercial software interests. Similarly, no individual blog is going to challenge Yahoo or *The New York Times*. But the idea of bringing together the focused, organized and peer-reviewed work of knowledgeable individuals can be applied to many fields, not just software. Perhaps this is what Google has in mind.

In this sense, blogs should be viewed as an important addition to the content marketplace. If commercial sources provide most of what people need for free, the potential for blogs will remain limited. However, should commercial content be withdrawn or made available only for a fee, the demand for alternatives will surely increase. In this sense, the blogosphere is likely to prove an effective long-term check on the power of commercial content interests, to the great benefit of us all. ◗

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READERS' LETTERS

Managing Projects Is a Unique Challenge

BASED ON MY EXPERIENCE, the pressures to rapidly advance a project to a certain stage (read as "coding") are enormous. To use Michael H. Hugos' analogy of constructing a building ["Working Hard: Making the Same Mistakes Over and Over," QuickLink 37307], no one would dream of asking an architect to show up one day and just start building. Even the simplest construction projects include extensive design and planning stages that ensure success.

These same steps are often bypassed in IT projects. But being given the proper amount of time to plan and design a system correctly would dramatically improve success rates. Too often, project sponsors and IT managers pressure engineers and programmers to move on to subsequent stages in an effort to report progress toward the goal. Attempting to compensate for previous failures during the coding stage will result in cost overruns, delays and, ultimately, failure.

Matthew Dill
Technical consultant, Mandolfo Associates, Omaha, dill_matthew@hotmail.com

WHILE MICHAEL H. HUGOS offered some excellent proposals for intelligent project management in his article, I take issue with his implication that IT can become a profession. It is a trade, a set of ever-changing skills, and establishing practical, all-embracing standards would be impossible.

Perhaps you could establish working standards in the narrower field of project management, but the term *profession* just doesn't fit management. Doctors, lawyers and psychologists all report to self-governing bodies, with behavior and ethical conduct parameters controlled by those bodies. Managers don't. Programmers don't. Project managers don't either.

Alex Rounds
Systems administrator, Shafer Electronics, Shafer, Minn.

Missing the Point

IT SEEMS THAT Bruce Claflin still misses the point ["3Com CEO Explains Renewed Bid for Corporate Business," QuickLink 37540]. The education sector was one of 3Com's biggest buyers, and our needs are real. Our shop has networks and equipment that outshine many industries in the area, and we value the cutting edge. Claflin discounts our 3Com business as only 4% of the market, and he is apparently more than willing to give that up. I was one who invested in ATM technology with a Cellplex 7000 core switch, an excellent choice when Token Ring was still rampant. I was cut off with no upward migration path and am looking to invest in a Catalyst 6500 soon. Customer loyalty is apparently still scarce at 3Com.

Michael A. Hall
Network administrator, Beaufort County Community College, Washington, N.C.

Outsourcing's Price

I WORK WITH overseas programmers frequently ["Outsourcing Growth Predicted, but Impact on Workers May Be Uneven," QuickLink 37459]. Their knowledge, skill and work ethic are comparable to what you find in the U.S., but there are several barriers to working with them effectively – primarily, language differences, time zones and business/work process knowledge. The language barrier erodes over time. The time-zone problem can be addressed by altering work hours. But the business/work process knowledge gap isn't easily tackled. In the meantime, we must insulate our business professionals from the pain of these barriers.

I agree that the outsourcing trend will continue and that IT salaries will shrink. But when salaries approach those of assistant managers at Burger King, we won't see many grads with computer science degrees. As a result, the U.S. will become totally dependent on foreign sources.

Gene Burke
IS planning specialist, Lake Jackson, Texas, ugunburke@yahoo.com

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. E-mail: letters@computerworld.com. Include an address and phone number for immediate verification.

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Q+A

With **Jim Demetriades**

SeeBeyond CEO Explains Why Everything You Knew About EAI Has Just Changed

You're now saying 'Everything you know about enterprise integration has just changed.' How exactly has EAI evolved over the last several years?

EAI began as a way to integrate one application with another, enabling data integration and synchronization. It then evolved to include business-to-business integration and business process integration, allowing companies to design and manage multi-step business processes. This was certainly an advance over the "spaghetti" approach of point-to-point interfaces, and has delivered a lot of business value by automating manual processes and machine-to-machine interactions.

However, this broader definition of EAI still falls short. Achieving the vision of the real-time enterprise is not simply a matter of automating business processes between systems, but also seamlessly inserting human interaction into the processes to handle exceptions. The true complexity of business processes, and the highest value, comes from handling exceptions well, and to end-users should be undistinguishable from other enterprise applications. What businesses need is a way to quickly assemble and deliver new enterprise-scale, end-user applications built by assembling existing business systems and functionality in new ways. This is where our latest offering, the SeeBeyond Integrated Composite Application Network (ICAN) Suite 5.0, comes into play.

Considering that integration costs are a significant part of software installations, do you see application development and integration coming together? If so, how?

Absolutely. Today, the IT infrastructure of most organizations has grown into a morass of disjointed systems. Traditionally, application development and integration have been completely disparate functions. The advent of the integrated composite application network changes all that. It builds upon the foundations of both application development and integration, adding the benefit of human brainpower in building composite applications. Automation is extended to encompass human touch, allowing people and systems to interact synergistically and give business users a deep new look into their organization and its ecosystem.

This new network is really a framework for creating new, enterprise applications from existing ones. This framework is now possible thanks to the convergence of several technology and business trends, including:

- the sufficient maturation of EAI;
- the commoditization of application servers;
- the adoption and maturation of open standards, including those for Web services;
- the widespread acceptance of portal functionality;
- and the demand from customers that vendors solve business problems cost-effectively, preferably by leveraging existing IT assets.

What is SeeBeyond's technology strategy for addressing this problem?

Our ICAN Suite 5.0 provides the architecture and tools that, for the first time, enable organizations to create new end-user applications assembled using existing business logic, functionality, and human intelligence from anywhere in an organization's ecosystem. The prospective business benefits are profound: The features and capabilities of ICAN 5.0 hold the promise of significantly reducing product cycle times and the cost of ongoing maintenance, while greatly improving productivity through unprecedented ease-of-use and support for open standards.

We believe that the ICAN Suite 5.0 fulfills the long-awaited promise of middleware. It also is the latest milestone of SeeBeyond's 14-year vision of helping customers manage the flow of information across all systems, applications and enterprises on a global basis.

What is SeeBeyond's competitive advantage in this space?

First and foremost, we have the most open and comprehensive set of integration tools available in our new ICAN Suite 5.0. We have an installed base of more than 1,800 customers including leading Global 2000 companies; a 14-year history of success; and a product suite written by a team whose senior members have been together for more than a decade. SeeBeyond knows what eBusiness and application integration can do today, and what it must do in the future.

As a company, we have been an innovation leader since the birth of the application integration industry. We introduced the first commercially available integration broker in 1991; the first fully-distributed integration architecture in 1999; and now, with the ICAN 5.0, the first business integration platform built on an open framework, including a J2EE-compliant integration server with the first composite application generator based on an open, services-oriented architecture.

"SeeBeyond knows what eBusiness and application integration can do today, and what it must do in the future."

In business terms, the goal is to give managers a clear idea of what's happening across their organizations, and the flexibility to improve whatever needs to be improved.

Any final words of wisdom for CIOs when it comes to making an integration project succeed?

Today, enterprise software equals business strategy. That means CIOs should be looking for solutions that possess the same attributes as good business strategy—namely flexibility, responsiveness, and cost-effectiveness. In the integration market, CIOs should seek vendors who understand that and who offer solutions that allow IT organizations to reach across the traditional barriers of application development and integration. Ideally, this will enable CIOs to create their future on the success of their past, without investing in a lot of new, expensive and hard-to-use technology.

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Introducing the Integrated Composite Application Network (ICAN) Suite 5.0 from SeeBeyond. ICAN provides unprecedented support for open standards such as J2EE and Web services. And it is a comprehensive platform that lets you quickly create new end-user business applications by assembling business logic and functionality from the information systems you already have. With ICAN 5.0, your IT strategy can finally keep up with your business strategy. To find out how, contact us TODAY.

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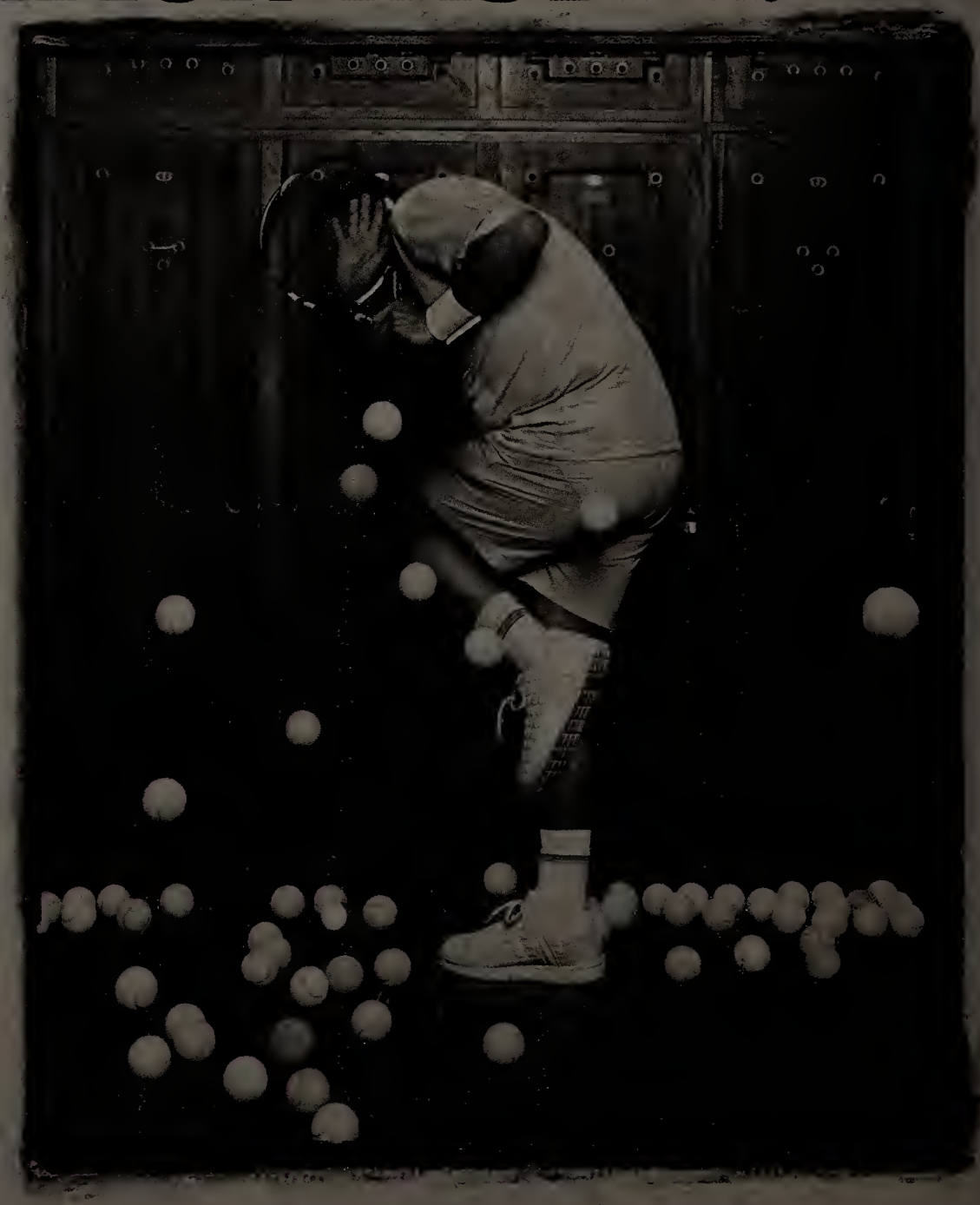
SEEBEYOND

REAL-TIME BUSINESS ISN'T JUST ABOUT GETTING INFORMATION FASTER.



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—Curtis Robb, Delta Air Lines CIO,
Delta Technology CEO

MOBILE&WIRELESS

05.05.03

Wireless Gets Down to Business
In the hands of pioneers, wireless technology is breaking new ground in key economic sectors, with applications that range from the everyday to the extraordinary. Page 30

The Wireless LAN FAQ
Thinking of deploying a wireless LAN? Read these frequently asked questions to get tips for success. Page 42

Working-Class Wireless
Wireless now supports a wide range of blue-collar applications, like the one that allows repair technicians to transmit data from customer sites to Sears' back-end systems, says Dave Sankey (right). Page 38

EDITOR'S NOTE

SPECIAL REPORT

Mention wireless technology, and most folks think of BlackBerries retrieving e-mail or stock quotes, or those hyped wireless access points at Starbucks and airport lounges. But these days, wireless technology is expanding its job description to include some grittier applications.

Lately, wireless has rolled up its sleeves and joined the working class.

Service technicians now use it in their trucks to call up repair information while at a customer's house. Bulldozer operators use it to get information on where to build the next road. Police officers use it to catch crooks by monitoring mug shots, maps and graphical data sent out from headquarters.

Wireless technology has even made its way into some everyday places, as pioneering industries take core wireless capabilities to new levels. Bring a garment into an RFID-enabled dressing room, and the color options and fabric information are displayed on a plasma screen. Or visit a wireless-enabled emergency room, where your doctor can call up your medical history on a PDA from the hospital's data repository.

These new applications bring with them exciting new possibilities that many of you are eager to explore. Our reader poll (see page 40) showed that 64% of respondents consider wireless technology important to their business goals.

In the pages that follow, we take a look at cutting-edge wireless uses and hear from industry observers about which wireless vendors are making the grade for corporate IT. You'll find answers to frequently asked questions about wireless LAN setups and read about new advances that the top wireless vendors expect to introduce this year. We hope that, armed with this information, you can put wireless to work in your own company. ◗

Ellen Fanning is special projects editor at Computerworld. *Contact her at ellen_fanning@computerworld.com.*

RICH LILLASH

WIRELESS AT WORK

LEARN HOW WIRELESS APPLICATIONS ARE EXPANDING BEYOND CAFES AND STOCK QUOTES.

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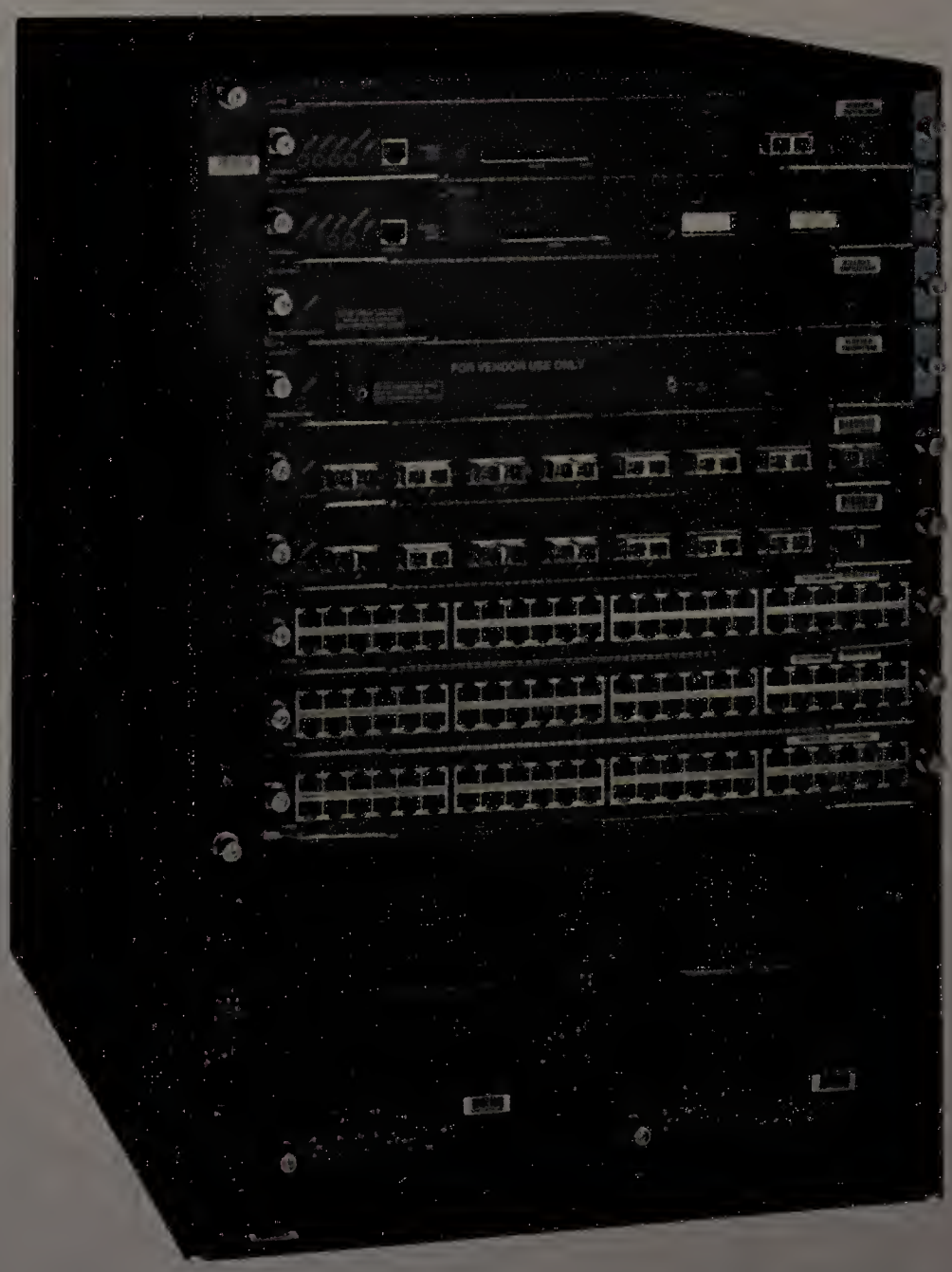

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WIRELESS GETS DOWN TO BUSINESS

IN THE HANDS OF THESE PIONEERS, WIRELESS TECHNOLOGY IS BREAKING NEW GROUND, WITH APPLICATIONS THAT RANGE FROM THE EVERYDAY TO THE EXTRAORDINARY.

BY STACY COLLETT

FROM RETAIL STOREFRONTS to the military's front lines, wireless technology now permeates nearly every sector of the U.S. economy.

The technology has come a long way from simple bar-code reading with wireless PDAs. Today, tags affixed to retail garments taken into a dressing room can wirelessly signal a wall-mounted screen to display color choices and fabric information. College students can do research in the cafeteria instead of the library, and forklift operators can save themselves hundreds of miles of travel in factories by receiving product requests from computers mounted on their vehicles.

By the end of 2002, seven out of 10 companies had adopted wireless technology, according to a survey of 1,251 U.S. and Canadian companies in 18 industries by IDC in Framingham, Mass.

"Economics and technology are making wireless available to a lot more people," says Ken Dulaney, an analyst at Gartner Inc. in Stamford, Conn. "We're seeing it increase in its capabilities. People know what it can do, and they're working on projects that make sense — updating them more into back-end systems."

Purchases of wireless hardware reached $2.2 billion in 2002 and are expected to top $3.9 billion by 2006, according to research firm In-Stat/MDR. Units sold will skyrocket from 18 million to 75 million in 2006, which suggests that the cost of deploying wireless will continue to fall.

To learn how wireless is being adapted to meet changing needs, we took a look at the most innovative uses of it in 10 sectors of the economy.

EDUCATION

The Challenges of Being First

Three years ago, Carnegie Mellon University was voted "Most Wired Campus" by the online publication *Yahoo Internet Life* for its pioneering use of wireless access in more than 30 buildings.

Today, five years after the university installed its first wireless LAN, administrators are looking to upgrade the system with new standards and faster speeds, which will require 1,200 new access points for the 7,000 registered wireless devices on campus.

It's a problem facing many institutions. Some 87% of schools and institutions surveyed by IDC now use wireless technology, and 90% say bandwidth and network availability issues top their list of technology challenges.

Rough estimates of the cost of Carnegie Mellon's upgrade are about $3 million, three times what the university has spent so far on wireless. What's more, funding isn't as plentiful as it was five years ago, says Chuck Bartel, director of network services.

But one simple truth has bumped the project up the priority list: "If you don't deploy it yourself, it will probably get deployed by someone else, and in a manner you don't want," most likely by tech-savvy students, Bartel says.

Bartel is concerned that if students don't have the wireless access they need, they'll find cheap hardware at a local electronics store and bring it onto campus. "If we haven't put the proper security in the mix, anybody can access university data," Bartel says.

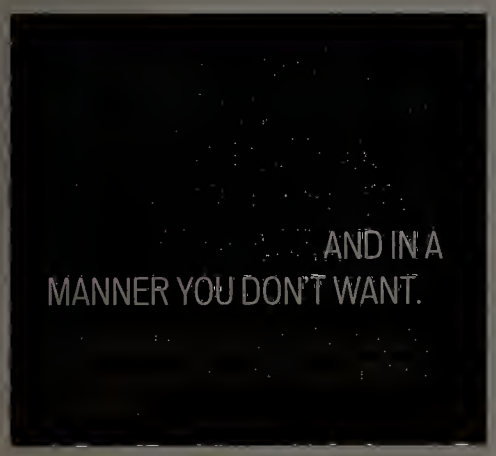
The combination of wireless access and tech-savvy students uncovers another truth — a network that's always available sometimes shouldn't be.

"At times," says Bartel, "faculty doesn't want access to the Internet or instant messaging between students" — during tests, for example. But now that wireless is being embedded into laptops and handheld devices, "it's a little more problematic," he notes.

But don't expect this technology institution to step back from the bleeding edge anytime soon. Carnegie Mellon is developing new uses for its wireless network in handhelds, laptops, robots and wearable computers.

Students in one graduate-level development course are working on intelligent agents embedded in handheld devices that will offer weather reports, restaurant options and even the location of friends, based on the user's location. The university's robotics institute is experimenting with collecting information by attaching wireless components to robots. "Once you have the infrastructure in place," Bartel says, "the juices start flowing in terms of

CHRIS HARTLOVE



how somebody can use it."

"They're using wireless LANs in classrooms because of the need to move around and just to give students the freedom to move anytime, anywhere," says Gartner's Dulaney. "They do it for convenience. Plus, they love to play with that stuff."

FINANCE

When Time Is Money

Soon after launching its first wireless offering in 1998, Fidelity Investments realized that wireless subscribers were very attractive customers. "They have more assets, they're more financially active and more tech-savvy," says Joe Ferra, chief wireless officer.

That appealing combination keeps the Boston-based firm listening to its customers' demands for new wireless features and monitoring their use of every new function.

Today the company's wireless offering, Fidelity Anywhere, lets 170,000 customers get real-time stock quotes, make after-hours trades, short-sell and, with phone-integrated BlackBerry handhelds, call a Fidelity rep with the touch of a button. The firm also now lets customers manage their retirement accounts, charitable donations and insurance needs wirelessly.

While wireless capabilities expand, security issues remain an obstacle. "The level of security just isn't high enough yet" for many financial services functions to be deployed wirelessly, says Wai Sing Lee, an analyst at Frost & Sullivan in Toronto. Until Wireless Application Protocol 2.0 or 802.11 standards come out, real innovation will be put on hold, he says.

Some two-thirds of the financial services industry uses wireless technology today, with about 20% of those users in the initial stages of a rollout, according to IDC. What's more, 29% of financial services companies surveyed have or plan to provide online trading capabilities to their clients.

Ferra says security remains a paramount concern, and Fidelity continues to "look at what's out there" in terms of security standards. But right now it relies on encryption and authentication developed using the Handheld Device Markup Language.

The firm even chooses which functions will be offered on each type of device based on security concerns, browser capabilities and latency. "It would be very difficult for me to convince people at Fidelity to offer real-time quotes over a given device if we know the latency is 30 to 40 seconds. It's got to be a lot quicker than that," Ferra says, adding that those discrepancies are becoming less of an issue.

"I'm convinced this will become a predominant way that people conduct their business with us. These devices are convenient, more reasonably priced and easier to use than ever before."

ENERGY & CHEMICALS

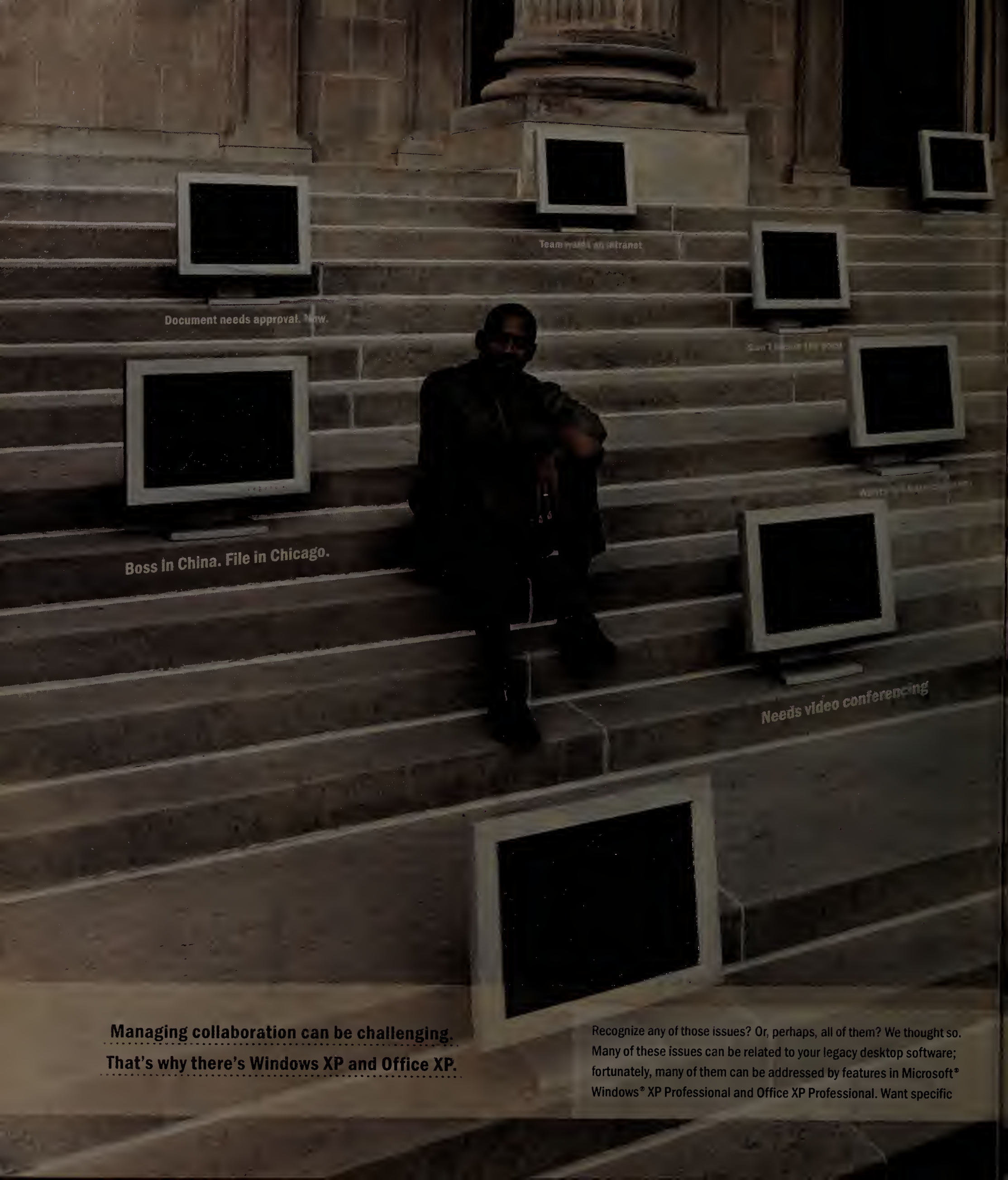
Wireless Powers Sales Force, Productivity of Maintenance Crew

Like most executives in the energy and chemicals industry, the upper echelons of Celanese Chemicals Ltd. are fairly conservative, says Bill Schmitt, the director of e-business at Celanese. "Anything that looks or smells like bleeding-edge technology makes us pretty nervous," he says.

But the $3 billion chemicals company was comfortable enough with handheld devices and wireless LANs by 2002 to adopt the technology primarily as a productivity tool for sales staff. Now the Dallas-based company is looking at wireless technology to speed maintenance at its chemical plants.

"When you run continuous production units, time is money," Schmitt says. When a pump goes down, for example, maintenance workers travel through football-field-size plants by foot or bicycle to inspect the problem and then travel back to the control room and storage room to arrange for repairs —

Continued on page 34



Managing collaboration can be challenging.

That's why there's Windows XP and Office XP.

Recognize any of those issues? Or, perhaps, all of them? We thought so. Many of these issues can be related to your legacy desktop software; fortunately, many of them can be addressed by features in Microsoft® Windows® XP Professional and Office XP Professional. Want specific

examples? Windows XP Professional offers built-in audio and video-conferencing capabilities that make the whole experience easy and intuitive for your end users. With the Send for Review feature, Office XP Professional lets users easily assign roles to everyone involved in the document review cycle, while automatically providing the correct tools for each reviewer and allowing changes to be easily merged back into the original document. And finally, several new features make deployment easier than ever. For more ideas about managing your desktops, visit **microsoft.com/desktop**

WIRELESS GETS DOWN TO BUSINESS

Continued from page 31

which could take up to an hour, he says.

In the future, employees will use Hewlett-Packard Co. Pocket PCs to report problems and arrange for repair equipment to be brought to the site. A pilot test is planned for later in the year.

Schmitt also wants to extend wireless capabilities globally to customers in China and Asia. But he acknowledges that the technology "isn't there yet."

Europe and Asia were quick to adopt mobile phones and Short Messaging Service messaging, he says, but "in wireless data, the U.S. is still ahead."

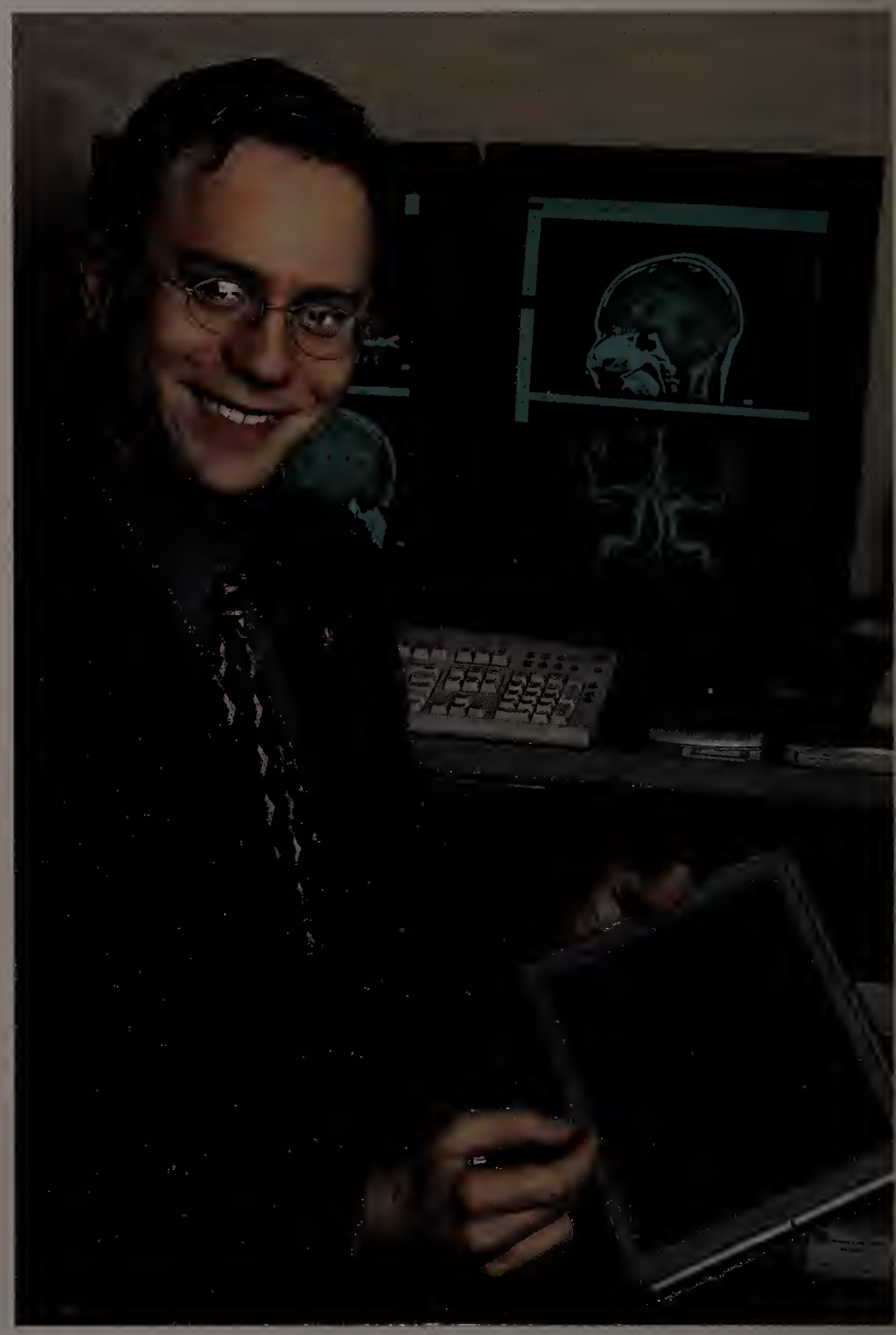
HEALTH CARE

Hands-off Technology in a Hands-on Business

As nurses whisk a critically injured patient into the emergency room at St. Vincent's Hospital in Birmingham, Ala., a physician grabs his PDA and with a few stylus strokes accesses the patient's medical history from the hospital's vast clinical data repository.

An admitting clerk scans the patient's insurance card and driver's license using a handheld device at the patient's bedside. After tests and surgery, caregivers will be able to access lab results, medication orders and surgery notes through wireless notebook computers or Pocket PCs that are synchronized with hospital systems for up-to-the-minute accuracy.

These everyday uses of wireless represent just the beginning of St. Vincent's plans for the six-building hospital campus, part of Ascension Health Inc., an $8.9 billion health care provider based in St. Louis. The St. Vincent's wireless network is the largest such network in health care in the Southeast.



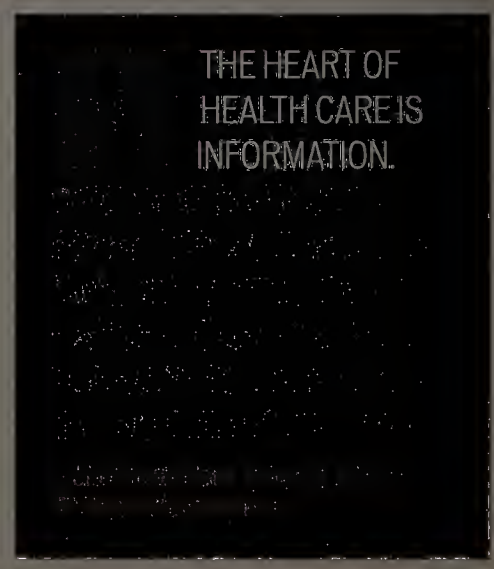
BILLY BROWN

"The heart of health care is information," says CIO Jim Stettheimer. "When you can make information available anytime, anywhere, you're laying the groundwork for huge strides in quality and patient outcomes."

At least eight out of 10 hospitals regularly use wireless technology today, according to IDC.

Health care workers "are in highly mobile environments where there's a requirement to gain access to information," says Chris Kozup, an analyst at Meta Group Inc. in Stamford, Conn.

The first phase of St. Vincent's project, which cost $1.6 million, included installing 167 Cisco Aironet 350 Series access points around the campus and a Cisco WLAN. The wireless network went live in July 2002 with 35 users, including physicians and admitting clerks who used Compaq iPaq Pocket



PCs, Fujitsu Stylistic 3500 Tablet PCs and some Dell and Compaq notebook computers using Cisco Aironet 350 network interface cards. By March 2003 the number of users had doubled.

As part of a "total leap" into wireless, Stettheimer's team is piloting wireless voice technology from Vocera Communications that allows clinicians to speak into badges worn on their lapels to contact co-workers.

Ultimately, 600 hospital workers, including doctors, nurses, physical therapists, transporters, social workers and pastoral staff, will send and receive information wirelessly using role-based security, which restricts the kinds of information these workers can access.

Return on investment is measured in terms of time saved and patient satisfaction. In the future, administrators will measure the time it takes to get a medical order through the system.

Stettheimer says the technology will succeed because physicians have been closely involved in designing and implementing the system. "That puts them in a position of ownership and investment in making sure that it works well," he says.

MANUFACTURING

The Shortest Distance Between Two Points Is Wireless

Automotive and aerospace plants lead the manufacturing pack in wireless device use, with about two-thirds of all companies actively using the technology.

General Motors Corp.'s Cadillac and Buick assembly plants mounted wireless computers from Symbol Technologies Inc. in Holtsville, N.Y., on forklifts so drivers can wirelessly collect and transmit data from the factory or warehouse floor. The forklift operators can also receive work instructions and and updates without leaving their vehicles.

The wireless network is expected to save $1 million at one GM assembly plant, according to a company statement. Forklift traffic has declined by 400 miles each day. After nine months of wireless use, forklift operators now average 60 to 70 deliveries a day, double the number of deliveries they were making before the system went live.

In a few years, manufacturers may be able to catch product defects by sensing out-of-range vibrations in industrial equipment using "smart dust."

Carnegie Mellon University's MEMS Laboratory is developing the devices, which are tiny wireless microelectromechanical sensors (MEMS) that can detect everything from light to vibrations. Thanks to recent breakthroughs in silicon and fabrication techniques, these "motes" could eventually be the size of a grain of sand, though each would contain sensors, computing circuits, bidirectional wireless communications and a power supply. Motes would gather scads of data, run computations and communicate that data using two-way band radio between motes at distances up to 1,000 ft.

Manufacturers are already experimenting with triangulation, which uses wireless access points strategically placed throughout a plant. The precise location of multimillion-dollar equipment that moves around the plant can be tracked using radio frequency identification (RFID) tags mounted on the equipment. "This allows asset tracking," says Meta's Kozup. "That's a bit of a future application, but some are experimenting."

RETAIL

This Season's Must-Have: An RFID Tag

Retailers are old-time users of wireless technology for communicating between the checkout counter and the back room and mobile point-of-sale terminals. But today's wireless technology can improve inventory accuracy, fight fraud and increase sales.

Forward-thinking retailers are venturing into RFID technology, chip-embedded tags that hold more information than a bar code and don't require direct contact with a reading device.

"A good 25% of all major retailers have dabbled in RFID," says Bill Allen, eMarketing manager at Texas Instruments Inc.'s RFID Systems. But most are holding off on full-blown implementations because of the poor economy, equipment costs or complicated supply chains.

Readers mounted on display shelves in stores can survey item tags and send inventory data to back-end systems rather than relying on point-of-sale data or manual counts. In the stock room, a tagged box's contents can be identified without opening the box.

At Prada's flagship store in New York, RFID-enabled dressing rooms are equipped with plasma display screens. When a customer brings a garment into the room, the screen reads

the tag and displays information on the designer and choices of fabric and color; it even offers accessory ideas.

While retailers such as Wal-Mart Stores Inc. and Target Corp. have piloted RFID tags on boxes and pallets, retailers that manufacture their own clothing lines are experimenting with individual garment tags. "We felt that retailers who have a vertically integrated supply chain like Benetton or J. Crew or The Limited, who are manufacturing their own goods, would be the first to take advantage of item-level RFID," says Jim Crawford, an analyst at Forrester Research Inc. in Cambridge, Mass. If retailers have control over the manufacturing facility, tags can be applied at the time of manufacture at no extra cost, he adds.

But at 25 to 50 cents apiece, the cost of individual tags is keeping item-level RFID at bay for many retailers.

"I foresee the use of RFID at the item level in five to seven years," Allen predicts. "I foresee more applications used for RFID for the carton and pallet level. We are not anywhere near being able to provide retailers with a 5-cent or penny tag. The technology is just not there yet."

TRANSPORTATION

Cost Is Still a Roadblock For Some Carriers

About one-third of the companies in the transportation industry used wireless technology at the beginning of 2002, according to IDC. The other two-thirds indicated that they planned to evaluate or implement the technology by the end of the year. Many are installing wireless fleet-tracking devices.

Nationwide trucking company TRL Inc. announced plans in February to convert its entire fleet of 600 trucks to Aether Systems Inc.'s MobileMax system for wireless tracking and messaging. The company has used integrated mobile communications in its fleet for nearly 10 years and recently decided to upgrade to a system that automatically switches between land-based and satellite communications without driver or dispatcher intervention.

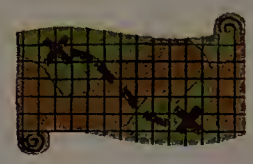
"It makes it easier to get the information necessary to dispatch and assign loads," said Mike Brown, vice president of sales and marketing for the transportation and logistics division at Owings Mills, Md.-based Aether.

Pittston, Pa.-based TRL said the new system will help improve the productivity of its fleet and bolster customer service. But when it comes to wireless adoption, some industry executives say cost is one of the biggest roadblocks.

"Customers are demanding that wireless providers take us to a much lower cost," but instead the industry is moving to expand offerings, says Dave Berry, vice president of Phoenix-based Swift Transportation Co. "We don't want to watch TV from our trucks; we want lower costs."

LOGISTICS

Getting It There Faster



The logistics industry has embraced wireless technology wholeheartedly for the past three years. Wireless LANs are used to manage large segments of the logistics chain, from container ports that handle bulk shipments of consumer goods to package delivery giants that track and manage worldwide shipments. Competitors in these areas now use wireless innovations to gain business advantage.

Memphis-based FedEx Corp. ratcheted up the competition with Atlanta-based United Parcel Service Inc. in February when it began deploying new handheld devices for its 40,000 FedEx Express couriers as part of a $150 million technology investment. The company selected Motorola Inc. to develop the PowerPad handhelds, which use Microsoft Corp.'s Pocket PC operating system and automated courier dispatch, pickup and delivery operations.

FedEx picks up and delivers about 3.5 million packages a day, and the PowerPad was designed to save 10 seconds at each stop, according to Ken Pasley, the courier's director of wireless systems development. FedEx expects a complete rollout over 18 months.

WIRELESS GETS DOWN TO BUSINESS

Continued from page 35

Unlike its current SuperTracker handhelds, also developed by Motorola, the new PowerPads can exchange data with FedEx's back-end systems, including its Web-based package-tracking applications, over AT&T Wireless Services Inc.'s nationwide mobile data network.

Craig Mathias, an analyst at Farpoint Group in Ashland, Mass., called the rollout a psychological victory over UPS, which is planning a similar rollout for early this year, as well as other undisclosed wireless innovations.

GOVERNMENT

Fighting Terrorism With Wireless

Federal, state and local governments — notorious for staying safely behind the technology curve — are uncharacteristically bullish on wireless technology. For many, the moves are a reaction to terrorism threats and new homeland security requirements.

The Los Angeles Police Department (LAPD) plans to install high-bandwidth WLANs at its 27 police stations by July to send mug shots, maps and graphical data to police officers on the street. The LAPD will deploy 1,500 Pocket PC handheld computers made by Symbol Technologies, which will include 802.11b WLAN cards.

Police departments in Baltimore and Glendale, Calif., have also developed interfaces between the WLAN radios built into the Symbol handhelds and the WAN-based radios used in police cars. Officers can use handhelds as remote units connected to the WAN while outside their vehicles.

The U.S. Department of Health and Human Services in March announced plans to test a wireless network operated by San Mateo, Calif.-based ePocrates Inc. to transmit bioterrorist health alerts to Palm OS-based handheld computers used by doctors across the country. Already, 250,000 doctors nationwide use ePocrates handhelds to determine the correct prescription and dosage for sick patients.

"Government is moving with the [wireless technology] curve," says Gartner's Dulaney. "The entire Congress has RIM BlackBerries for e-mail. They rely on it." On the state level, wireless use is fragmented because officials disagree on which departments have critical communications needs that would require it, he says.

Security and business concerns in New York have officials there considering putting wireless access points in subway tunnels so people can talk when they're underground. "New York believes being connected is extremely important for the health of its business, especially since 9/11," Dulaney says.

DEFENSE & MILITARY

Wireless on the Front Lines

On the battlefields of Iraq, Afghanistan and Southwest Asia, Army troops have replaced the sneakernet used to requisition supplies and maintenance during the 1991 Persian Gulf War with wireless technology that can save time, money and maybe even lives.

Now, instead of loading a floppy disk with logistics information, supply chain reorder forms, mechanical parts orders and requisitions for vehicle maintenance and then carrying it to base camp for processing, troops are using CAISI (pronounced "Casey"), the Army's Combat Service Support Automated Information Systems Interface. The technology went into the field in October 2002 and is now used by four of the Army's 10 divisions.

"It used to take a week or so to get these supplies commissioned and back to the troops," explains Maj. Salvatore Fiorella, assistant product manager. "CAISI increases the capability to order supplies by getting the wheels turning immediately, as soon as the transmission is made."

In one instance, CAISI saved a unit in Southwest Asia $40,000 in hardware costs, the two weeks it would have taken to run wire, and hours of negotiations with the host country to get approval for laying down extra wire.

The system can transmit data about three to four miles, which has limited its use once troops venture deeper into enemy territory. But "with satellites linked to CAISI, that just brings it to the battlefield," Fiorella adds.

The wireless system consists entirely of off-the-shelf hardware and software. Laptop computers in the field are physically connected to wireless modules, which are triple-encrypted using software from Fortress Technologies Inc. in Oldsmar, Fla., even though CAISI's use is restricted to "sensitive but unclassified" information.

CAISI is just one of the Army's efforts to have 802.11b wireless devices deployed in the field between 2008 and 2010, once all security issues have been addressed. "We have to worry about encryption, we have to worry about firewalls, we have to worry about nonworking communication lines," says George Knizewski, lead engineer and contractor at the U.S. Army Program Executive Office, Enterprise Information Systems (PEO, EIS), at Fort Belvoir, Va. "We don't want to be on the bleeding edge of technology."

Today, government agencies require wireless technology to meet the Federal Information Processing Standards (FIPS). "Unless it's up to that level of security, government agencies can't deploy them," says Frost & Sullivan's Lee. CAISI is one of the first Army systems to be FIPS-compliant, which opens the door to many future uses.

"I see wireless bringing better assistance to the [troops] that are deployed, providing rapid information so they can see what's available on the battlefield, which will help leaders to determine what combat units are equipped to go forward," Fiorella says.

Collett is a freelance writer in Sterling, Va. Contact her at stcollett@aol.com. Bob Brewin and Tom Hoffman also contributed to this report.

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9:00am to 9:45am	**Industry Update** **Evaluating Your IT Sourcing Options** Bart Perkins, Managing Partner, Leverage Partners
9:45am to 10:15am	**Business Case Study** James Beattie, EVP and CTO, CCC Information Services
10:15am to 10:30am	Refreshment Break
10:30am to 11:30am	**Outsourcing Strategies** **Leadership Strategies in Offshore Outsourcing** Moderator: Maryfran Johnson, Editor in Chief, Computerworld Panelists: ■ Jerry McElhatton, Senior EVP of Global Technology and Operations, MasterCard International ■ Joe Drouin, VP and CIO, TRW Automotive ■ Tasos Tsolakis, VP of Global Technology Operations, Global Exchange Services ■ James Beattie, EVP and CTO, CCC Information Services
11:30am to Noon	Open Forum

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BY BOB BREWIN

IN A WIDE RANGE of companies, wireless often wears a blue collar, supporting gritty but essential applications far removed from the world of executive BlackBerry pagers or airport lounge wireless LAN "hot spots."

These emerging blue-collar wireless uses make possible fundamental business processes that often can't be hooked into wired networks due to geographic or environmental conditions, says Craig Mathias, an analyst at Farpoint Group in Ashland, Mass.

In the Trucks

It was geography that dictated the design of Sears, Roebuck and Co.'s new wireless system for its products repair division. The cab-mounted Mobile Base Station installed last month on all 10,000 repair trucks had to provide 100% nationwide coverage so technicians could wirelessly transmit data from customer sites anywhere in the U.S. to back-end systems, says Dave Sankey, director of process and technology development at Sears.

According to Sankey, the Mobile Base Station, developed by Wireless Matrix Corp. in Calgary, Alberta, houses a WLAN, terrestrial packet data and satellite system in a package that's 11 in. wide by 6.7 in. high.

The retailer has also equipped its service technicians with Smart Toolbox, a rugged, Pentium-powered touch-screen laptop from Itronix Corp. in Spokane, Wash. Each laptop comes packed with a library of product repair information that includes more than 90,000 illustrations and schematics of every product the company sells and services, from washers to lawn tractors. The product library also contains a list of 44.5 million parts that might be needed to make repairs, as well as an inventory of the 2,500 parts carried on every truck, Sankey says.

The laptops also have built-in 802.11b WLAN modems, which communicate with the Mobile Base Station. Service technicians no longer need to leave a customer site to order a part not found in the database. They can place the order with a supplier, with the WLAN serving as the link to the Mobile Base Station, Sankey says.

Al Milligan, executive vice president for business operations at Wireless Matrix, says the WLAN access point in Mobile Base Station connects with two wide-area wireless systems: a terrestrial network that operates over Atlanta-based Cingular Wireless' Mobitex packet data network, and the mobile satellite system operated by Mobile Satellite Ventures LP in Reston, Va.

Controller software built into Mobile Base Station includes "best route" algorithms that select the terrestrial or satellite circuit with the strongest signal that's closest to Mobile Base Station, Milligan says.

Although satellite data service is viewed as expensive, Milligan says his company buys large blocks of satellite time from Mobile Satellite Ventures, minimizing the cost differential between satellite and terrestrial service. The data rates for both the Mobitex network and the mobile satellite system are relatively slow (8Kbit/sec. and 6.75Kbit/sec., respectively), but Sankey says that's good enough for the "bursty" and low-bandwidth traffic sent to and from Smart Toolbox applications.

Russ Molitor, a Sears service technician in Bloomingdale, Ill., has been a Smart Toolbox and Mobile Base Station beta tester for the past 18 months. He says he saves invaluable time locating parts because he can communicate directly from the job site, rather than having to walk back to his truck.

It also eliminates the time he used to spend on the phone — often waiting on hold — trying to find a part from Sears' myriad suppliers. Molitor says being able to order online saves him from the routine mistake of ordering the right part but in the wrong color.

Sankey declines to specify total costs or investment payback for Smart Toolbox and Mobile Base Station, ex-

ANDY GOODWIN

DAVE SANKEY, an IT executive at Sears, holds a Smart Toolbox, a rugged laptop that holds a library of product information.

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cept to say that the hardware bill alone totaled $60 million. He says that money has already been recouped by time savings from the product and parts library system.

In the Mines

Geography was the reason for the installation of a WLAN system that spans 20 square miles at the Thunder Basin coal mine in Wright, Wyo., operated by St. Louis-based Arch Coal Inc. Jim Long, a Global Positioning System (GPS) project engineer at the mine, says the WLAN consists of a 2.4-GHz cross-mine link with six access points feeding another three access points in the 900-MHz band. The WLAN serves as the backbone for the MineStar integrated mining information system developed by Caterpillar Inc. in Peoria, Ill.

The WLAN distributes finely tuned location data from on-site GPS kinematic receivers. Those receivers grab the GPS signals from space and refine the location data so it's accurate to within 1 centimeter instead of 25 meters. This location data is distributed to WLAN terminals and GPS receivers hooked up to rugged computers with color displays in the 35 coal-hauling trucks and six bulldozers that operate in the mine, Long says.

When a new road needs to be built, Long says, he designs it on an office-based computer-aided design (CAD) system and sends it over the network to a bulldozer operator. "[The bulldozer operator] can see what he needs to cut and fill to build that road," says Long. The WLAN in the bulldozer also automatically feeds real-time information of the work it's doing back to the office CAD system, allowing supervisors to monitor progress, Long adds.

Coal mines might fall at the end of most people's lists of businesses that are likely to be Internet-enabled, but Michael Murphy, Caterpillar's MineStar manager, says mining equipment has become so automated that the average mine truck or bulldozer has five IP addresses.

The automation pays off in an industry driven by wildly fluctuating commodity prices, Long says. When coal prices increase, the wireless network helps Thunder Basin quickly ramp up production. In tight times, it brings efficiency to an operation that has to watch its costs, he says.

On the Docks

Mike Taylor, CIO at Todd Shipyards Corp. in Seattle, installed a system that uses an 802.11b WLAN and rugged Palm OS-based handheld devices from Symbol Technologies Inc. in Holtsville, N.Y., to help manage one of his company's biggest costs: timekeeping and management of its 1,200 union workers. The old timecard system was prone to error, subject to rounding by workers and took 24 hours to transmit information to managers.

The Electronic Labor and Time Collection system, online since October, provides Todd Shipyards with highly accurate time records and a better way for managers to allocate personnel from job to job — and keep track of billing for various projects happening within the 44-acre shipyard. All workers have a magnetic-striped badge, which they swipe at a wired PC terminal when they check in.

Once workers have checked in and been assigned a task, that information is sent to one of 66 "leadmen" supervisors equipped with Palm wireless PDAs. The Palms let supervisors see at a glance the number of workers on each job within the yard, by craft and department. This allows Todd Shipyards to create a payroll and cost record for each job automatically and instantly at the end of the day when each worker clocks out.

The project cost about $300,000, Taylor says, and it has already paid for itself by eliminating inaccurate time records for workers paid by the hour.

Taylor emphasizes that installing a WLAN system in a shipyard of that size is daunting. Not only does the area far exceed the 300-foot range of a single WLAN access point, but the metal structures within the yard also interfere with signal propagation. Taylor says he needed to install 33 access points, some with high-powered antennas, to cover the area.

Although much of the hype about the potential of wireless focuses on office or consumer applications, the technology really pays off at work on the remote front lines of many businesses, where wireless is the only communications alternative, says Farpoint's Mathias. ◗

WLAN AIDS POLICE FORCE

A new Wi-Fi-based network provides 11Mbit/sec. data rates to police cruisers in a 60-square-mile area:

QuickLink 38105
www.computerworld.com

SNAPSHOTS

38% of respondents said the economic downturn has had no impact on their organizations' wireless projects.

29% said the recession has caused funding to be delayed but planning is still moving ahead.

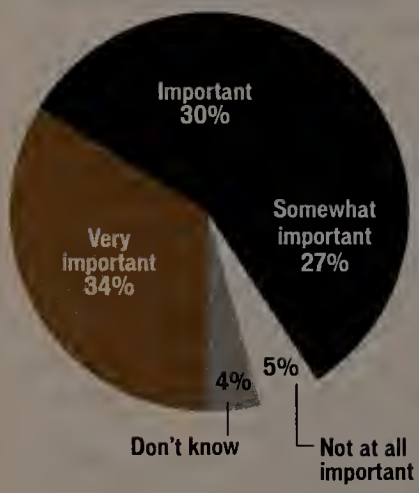
12% said projects were put on hold this year.

5% said their wireless projects have been delayed indefinitely.

1% said their projects had received more funding, and less than 1% said their project schedule had been accelerated.

Wireless Priorities

How important is wireless technology to your organization's business goals and strategy?



The Top 10 Wireless Devices in Use

1	Laptops
2	Cell phones
3	Handheld devices
4	Pagers
5	Tablet PCs
6	Bar code readers
7	BlackBerry devices
8	Smart phones
9	Mobile data phones
10	Rugged handheld terminals

SOURCE: *COMPUTERWORLD.COM*, MARCH 24-APRIL 4
BASE: 323 SURVEY RESPONDENTS

ANALYST REPORT CARD

INDUSTRY WATCHERS FROM TOP ANALYST FIRMS WEIGH IN ON WHICH WIRELESS SEGMENTS AND VENDORS ARE MAKING THE GRADE FOR CORPORATE IT.

BY MATT HAMBLEN

Which wireless vendors are poised for growth? And which are best answering the needs of corporate IT? Computerworld *posed those questions to a group of industry watchers. Here's what they had to say:*

Wireless LAN Hardware and Software

OVERALL GRADE: A

Vendors that sell gear and software for wireless LANs are a bright spot in the wireless industry, analysts say. What's important to corporate IT is the trend toward a distributed WLAN infrastructure, which means putting WLAN intelligence on a controller device or switch in a wiring closet to control multiple, light access points, says Craig Mathias, an analyst at Ashland, Mass.-based Farpoint Group.

Symbol Technologies Inc., Proxim Inc. and start-ups such as Aruba Wireless Networks, Trapeze Networks Inc. and Airespace Inc. are developing such designs, says Gemma Paulo, an analyst at In-Stat/MDR in Scottsdale, Ariz.

Business users will see a growing number of WLAN embedded clients in laptops from IBM, Hewlett-Packard Co., Dell Computer Corp., Toshiba Corp., Fujitsu Ltd. and Sony Corp., Paulo says, and other vendors will provide embedded Wi-Fi access for PDAs. Motorola Inc., Proxim and Avaya Inc. have struck a deal to develop a combination cellular/Wi-Fi handset.

PROGRESS REPORT: Analysts say vendors in this market are all making the grade. It may surprise some to know that when it comes to wireless access devices, Cisco Systems Inc. is the No. 1 vendor to the enterprise market, says Paulo.

The top performers in WLAN security are companies that rely on standards, including Fortress Technologies Inc. in Oldsmar, Fla., and Funk Software Inc. in Cambridge, Mass., says Wai Sing Lee, an analyst at Frost & Sullivan in Toronto.

Mobile Carriers

OVERALL GRADE: D

"The overall mobile operator community is doing a pretty miserable job of supporting the enterprise," says Ken Dulaney, an analyst at Gartner Inc. in Stamford, Conn. "They want to [reach out] to corporate customers, but their people are poorly trained."

Dulaney says his corporate IT clients continually complain about a lack of IT knowledge among carriers that are now reselling cell phones and smart phones (as well as PDAs with wireless capability) and offering to integrate the devices with corporate networks and databases.

"The problem is that most carriers have sold network pipes at [a certain price per bit] and haven't trained their sales and support teams for needs of IT," he says. "If an IT exec tells a carrier he wants to link a smart phone over wireless back to DB2, the carrier's rep is likely to say, 'What is DB2, a character in *Star Wars*?' "

Wireless operators are the No. 1 reason for the slow rollout of wireless data applications, Dulaney says. "Operators control the choke point but don't have the talent to guide deployments forward," he says.

Mathias agrees that cellular carriers are in a sorry state. "All the carriers don't have enough cells, but there's no excuse for that anymore, and it's becoming unacceptable," he says.

The carriers also face a preponderance of problems with billing, including overly complex plans for corporate customers, Mathias says. He urges IT managers to watch for hidden charges.

PROGRESS REPORT: Dulaney says traditional IT vendors such as IBM and HP get an A for sales, integration and support, but most wireless carriers get a failing grade. Exceptions include Nextel Communications Inc. in Reston, Va., and Sprint PCS Group, Dulaney says, but the others are "off the deep end."

Mathias rates New York-based Verizon Wireless as the best carrier because it has more complete cellular territory coverage.

Handheld Devices

OVERALL GRADE: B

Handheld hardware is beginning to drop in price, following the lead of Dell and HP, says Alex Slawsby, an analyst at Framingham, Mass.-based IDC. That price competition is making it hard for PDA makers Palm Inc. and Handspring Inc. to focus on software and on finding software-licensing partners, he adds.

Dell is also putting research-and-development funds into wireless data transport, hardware and applications, and when various standards are set, Dell can be counted on to enter the market at a low price point, says Sam Bhavnani, an analyst at Current Analysis Inc. in Sterling, Va.

Research In Motion Ltd. (RIM) in Waterloo, Ontario, has always focused solely on the corporate user, analysts say. Although the company originally offered a handheld device that provided convenient wireless access only to e-mail, it's now expanding its relationships and broadening its product line.

RIM is working with several carriers as well as Microsoft Corp. and London-based Symbian Ltd. for software development, Bhavnani says.

PROGRESS REPORT: Slawsby says the vendors getting top grades with corporate customers are those offering the fastest return on investment. He says that group includes RIM and Good Technology Inc., a Sunnyvale, Calif.-based RIM competitor.

Emphasis on ROI will continue to be a key factor, says Mathias. "IT managers don't have the money they used to have and don't want to experiment," he says. "The wireless data industry grew in recent years off experiments, but now people want serious ROI."

VENDOR VIEWS

WHERE IS THE WIRELESS INDUSTRY HEADED? FIVE TOP VENDORS OFFER THEIR TAKE ON THE FUTURE OF WIRELESS LANs, HARDWARE, STANDARDS AND SECURITY.

The future is unfolding fast in the wireless industry. Computerworld *spoke with five top vendors to get their opinions on where the market is heading and what advances IT managers can expect in the coming year.*

Virtual roundtable participants:

CHRIS BOLINGER, manager of partner marketing, Cisco Systems Inc.

JIM JOHNSON, vice president and general manager, wireless networking, Intel Corp.

JOHN ROESE, chief technology officer, Enterasys Networks Inc., Andover, Mass.

RAY MARTINO, vice president and general manager of the network products group, Symbol Technologies Inc., Holtsville, N.Y.

LYNN LUCAS, director of solutions marketing, WLAN division, Proxim Inc., Sunnyvale, Calif.

What does the client of the future look like? According to most estimates, 15% to 20% of notebook computers currently ship with wireless capabilities. That's expected to jump to 70% in the next several years, according to Intel's Johnson. While wireless technology poses battery problems for PDAs, "more and more, Wi-Fi technology is proliferating in everything," Enterasys' Roese says.

But wireless vendors are also focusing on cellular phones. "An upcoming capability is to have a cell phone work over a wireless LAN infrastructure," Proxim's Lucas says. "Today, you can operate handsets over the 802.11b infrastructure, but if I can operate the cell phone over the WLAN infrastructure, that's a significant cost savings."

Cisco sees "combo phones" emerging next year that would use traditional cellular service when outside and the WLAN infrastructure indoors. "It won't be until 2005 that they really take off, though," Cisco's Bolinger says.

Which wireless standard will take precedence in the next year? Vendors agree that 802.11b will prevail for the next year. Acceptance of 802.11a, they say, has been slow, mainly due to economics. Prices for 802.11b "are going through the floor," says Bolinger. Meanwhile, moving to 802.11a would require technology upgrades or replacements, and increasing the speed of current wireless applications probably isn't critical enough to justify the cost. "In the enterprise market, I'd say wait until 802.11a is more mature," says Symbol's Martino.

By the end of 2004, however, 802.11a will have its day, vendors say. "802.11a will start ramping in the second half of next year, and enterprise clients will start to do validations in the second half of the year," predicts Johnson. And 802.11g will make some gains, but not as much as 802.11a, because with the latter, you get more network capacity and channel density. "If you're trying to deploy media-rich, high-bandwidth wireless, 802.11a is clearly the right choice," says Roese.

Lucas is one dissenter. "We're seeing a leaning toward 802.11g, and that's because people are interested in the higher speeds but they want the backwards compatibility with existing 802.11b technology," she says.

What developments do you see happening in security? Vendors agree that for most companies, security should no longer be a showstopper. By this fall, vendors will be required to support the Wi-Fi Protected Access (WPA) standard in order to be Wi-Fi-certified.

The Wi-Fi Alliance released WPA late last year with the intention of strengthening the weak Wired Equivalent Privacy encryption standard that was previously built into Wi-Fi products. WPA also serves as an interim step toward 802.11i — a set of standards that's expected to answer most security needs but won't be finished until early next year. "WPA is going to be the next important milestone in ensuring that 802.11 products are secure and can interoperate with other Wi-Fi products," says Lucas.

What management improvements will be made to WLANs? Now that security is no longer an insurmountable hurdle for enterprise WLANs, vendors contend, the next big issue is manageability. "The chief cost of WLANs are people costs, and good management will lower costs. That's why it will be a big topic for next year," Bolinger says.

A new model of wireless networking will become popular in the next year to take some of the labor out of managing WLANs, according to Roese, Martino and Lucas. It involves moving intelligence out of the access points and into a central switch, resulting in centralized, automated remote management capabilities.

In addition, says Lucas, the new architecture will help with security management, policy-based management and bandwidth management.

Exactly how this will be accomplished varies depending on what the vendors actually sell. Roese says Enterasys will ship technology this year that will help shift intelligence into the switch. Lucas says Proxim's Meistro management infrastructure will be available later this year, and Martino says Symbol also has improved management capabilities in the works.

The picture changes a bit with Cisco. "These management issues need to be addressed, but not necessarily by buying a specialized controller," Bolinger says. Cisco offers access points with management features, as well as a management platform for remotely managing hundreds of access points from a single console. The company plans to announce advanced management capabilities in the coming year, Bolinger says. ◗

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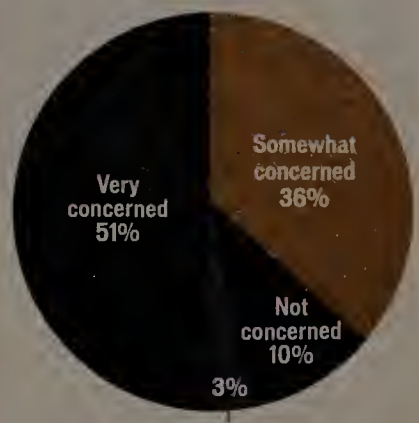
SNAPSHOTS

Wireless Insecurity

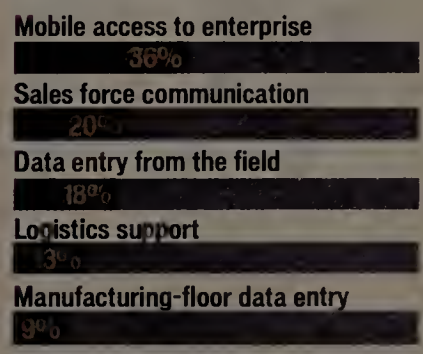
How concerned are you about wireless security?



Top 10 Problems

1	Security
2	Interoperability
3	Lack of nationwide coverage
4	Conflicting standards
5	Lack of local coverage
6	Lack of funding
7	Third-party service limitations for cell phones (i.e., dead spots)
8	Slow adoption rate
9	Data rates/pricing systems are confusing or have hidden costs
10	Poor ROI

Top Five Business Uses for Wireless



Note: Multiple responses were allowed.

ABOUT THE SURVEY: *Computerworld*'s wireless survey was conducted online at *Computerworld.com* from March 24 through April 4. Respondents totaled 323. The average employee head count at respondents' companies was more than 5,000; average IT department size was fewer than 50 employees.

THE WIRELESS LAN FAQ

THINKING OF DEPLOYING A WIRELESS LAN? ANSWERS TO THESE SIX FREQUENTLY ASKED QUESTIONS OFFER TIPS FOR SUCCESS.

BY JOANIE WEXLER

WIRELESS LANs are finally venturing out of their vertical market niches and into mainstream business environments. But they pose some special deployment challenges when compared with their wired counterparts.

Here are six frequently asked questions IT managers should consider before installing a WLAN.

1 How do I plan capacity for a mobile network? Wireless experts suggest that you first identify which applications the network will support and how much bandwidth they will consume. Then calculate how many users need mobility and in what places within your organization they will require it.

Next, apply this information in designing a network of wireless access points (AP). APs are the infrastructure radios, usually ceiling-mounted, which connect to the wired network on one side and to users' wireless network adapters over the airwaves on the other. Wireless veterans stress the importance of site surveys and performance testing to optimize AP placement.

"This is because variations in firmware, antennas and physical layout can alter the performance and range of the very same [wireless] chip set," says Craig Mathias, an analyst at Farpoint Group in Ashland, Mass.

Because it's difficult to anticipate where walls and objects will interfere with wireless communication, a network staff member armed with a wireless laptop typically walks around, installs APs and tests coverage -- often trying out multiple antenna options for maximum signal strength.

This exercise will reveal how many APs you need to meet capacity requirements and how to position adjacent APs to prevent coverage holes. There are some rules of thumb about how many users a single AP can support. Gartner Inc., for example, recommends about 20 knowledge workers per 802.11b (11Mbit/sec.) radio.

But these ratios vary. Warehouses often need lots of APs to ensure floorwide coverage. But warehouse applications don't consume much bandwidth, and utilization of these APs is often only 2%, says Rob Greenfield, chief scientist at SCLogic Inc., a reseller of WLANs in Beltsville, Md.

On the other hand, a crowded office space will require many more APs — not to achieve range, but to support more users and heftier applications.

"Shoot for under 40% to 50% AP utilization in office environments," Greenfield suggests. That will compensate for not knowing how many users will be in range at any given time.

2 How can I avoid interference? Having multiple devices that use the same frequency can result in interference with performance. United Parcel Service Inc. learned this when it combined short-range Bluetooth (1Mbit/sec.) wireless technology with 802.11b LANs in a warehouse pilot, explains Joan MacEachern, lead telecommunications analyst at the Atlanta-based worldwide package-delivery company. Both Bluetooth and 802.11b run in the 2.4-GHz frequency band.

To solve the problem, UPS and its technology vendor, Symbol Technologies Inc. in Holtsville, N.Y., synchronized the Bluetooth network with Symbol's 802.11b APs. "Time Division Multiple Access technology in Symbol APs has scheduled the two networks to transmit at different intervals to avoid overlaps," explains MacEachern.

And don't forget to alternate use of 802.11b channels in neighboring APs to further minimize interference, advises John Lawson, vice president of IT and CIO at Tulane University in New Orleans. The university has installed 1,200 APs from Andover, Mass.-based Enterasys Networks Inc. across multiple campuses.

To segregate traffic in neighboring devices, 802.11b offers three different channels. "I've tried installing APs without channel planning," says Lawson. "The result was unacceptable interference."

3 Is my WLAN really secure? This is a complicated question. Security advances collectively called Wi-Fi Protected Access (WPA), based on emerging IEEE standards, will ship in new products later this year. WPA overcomes the notorious static-encryption-key weaknesses in 802.11b's Wired Equivalent Privacy standard. In addition, comprehensive vendor-proprietary products and services have long been available to reinforce wireless privacy.

However, to optimize security in WLANs immediately, the best approach is to employ IPsec virtual private networks, which use Layer 3 encryption, even on a local enterprise campus, says Dave Passmore, an analyst at Burton Group in Sterling, Va.

"This requires IPsec client software on user laptops and a device that terminates IPsec tunnels inside the enterprise network firewall," he explains.

Passmore notes, however, that forthcoming WPA-compliant products should resolve the need for local IPsec use in many organizations.

4 Which technology should I choose from the alphabet soup of WLAN standards? Ken Dulaney, an analyst at Gartner in San Jose, has a simple answer: "802.11b is the only mature, worldwide standard that can be deployed today," he says. "For most enterprises, 802.11b bandwidth should suffice for most office tasks for at least the next four years."

UPS, for example, is "building to current requirements, which is 802.11b," both in its warehouses and at its IT headquarters, says Fred Hoit, UPS's radio frequency infrastructure manager. "We anticipate a five-year life cycle," Hoit says.

Opinions are mixed about 802.11a, the successor to 802.11b that runs in the 5-GHz frequency band with much faster speeds (54Mbit/sec.) but a shorter coverage range. On the plus side, you avoid interference when running 11a and 11b in parallel, because the two LANs use separate frequencies. But Greenfield says it's worth waiting a year for 802.11g-compliant products to gain cross-compatibility with 802.11b.

The shorter transmission range of 80211a "means you'll need many more APs for the same coverage, which will be more expensive," he says. Like 802.11a, 802.11g supports aggregate 54Mbit/sec. speeds but runs in the 2.4-GHz band and was designed for backward compatibility with 802.11b.

Finally, emerging dual- and multimode products "will eventually make upgradability a nonissue," says Mathias. Several enterprise-class vendors offer APs that support 802.11a and a slot for either an 802.11b or 802.11g radio.

Meanwhile, trimode 802.11 b/a/g chip sets recently began shipping, so client adapters and APs that support all WLANs could be available within a year.

MOBILE DATA SERVICE OPTIONS

Carrier*/ Mobile WAN technology	2.5/3G WAN service coverage (U.S.)	Wi-Fi services?	Number of Wi-Fi hot spots
AT&T Wireless GSM/GPRS	5,000 cities and towns; GPRS roaming agreements in 25 countries	Yes	600 in North America
Cingular Wireless GSM/GPRS	67 cities and towns on self-run network; roaming agreements with AT&T Wireless and T-Mobile in the U.S. expand footprint	No	N/A
Sprint PCS CDMA/1XRTT	4,000 cities and towns	No	N/A
T-Mobile GSM/GPRS	8,000 cities and towns; GPRS services available in 15 countries	Yes	2,300 in North America; 200 in Europe
Verizon Wireless CDMA/1XRTT	900 cities and towns	No	N/A

* Includes North America's largest mobile WAN wireless licensees. Nextel Communications Inc. isn't listed because its network, based on Motorola Inc.'s iDEN technology, isn't a standards-based 2.5/3G network and runs at just 15Kbit/sec.

SOURCE CARRIER-SUPPLIED INFORMATION

5 What's the best way to manage my radio infrastructure? A wave of new WLAN "switch" architectures from established companies such as Symbol and Proxim Inc., as well as from a bevy of start-ups, aim to ease AP configuration and management in large installations. The idea is to centralize control of a dumb AP infrastructure in a "smart" collapsed-backbone device.

This approach purports to lower the cost of each AP — which adds up in large shops that might require hundreds or thousands of them — and to enable greater scalability and lower operations costs.

But that doesn't mean that if you want a smart AP, you can't get centralized management, too — unless this option blows your budget. For example, Cisco Systems Inc. offers its Wireless LAN Solutions Engine, a data center appliance and CiscoWorks management module that centrally configures and manages up to 500 APs. But Cisco Aironet 1100 and 1200 APs are far from dumb; they run the full complement of Cisco Internetworking Operating System routing software — enabling, for example, wireless virtual LAN (VLAN) support.

Symbol also supports wireless VLANs, but it builds them into its Mobius Axon wireless switch, not into the AP. VLAN profile information is enforced before incoming traffic hits the wired network or outbound traffic is distributed to wireless users.

6 Can I integrate WLANs with other networks? Network nirvana is when users can roam among disparate wired and wireless networks without having to reconfigure settings or reauthenticate. Multimode products are emerging that combine several versions of 802.11, as well as connectivity to 2.5- and 3-generation (2.5/3G) mobile WANs from the licensed carriers. For example, Texas Instruments Inc. in March announced chip sets for PDAs that combine 802.11b, GSM/GPRS and Bluetooth capabilities. NetMotion Wireless Inc. in Seattle has client software for roaming among any type of packet-based wired or wireless LAN or WAN. The software simply detects the most robust network connection available and transparently connects the user to it, keeping VPN sessions intact.

Such internetwork roaming will grow increasingly handy as WLAN-based public services, called Wi-Fi hot spots, continue to sprout up in airports, hotels, malls and other public locations. The licensed 2.5/3G carriers have begun offering 802.11b-based hot-spot services to complement their ubiquitous, but slower, 2.5/3G packet data services (see chart above).

Today's 2.5/3G services provide 20K to 60Kbit/sec. throughput per user, depending on the technology used. So multimegabit-speed Wi-Fi networks, where available, offer a better-performing option.

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WLAN CHECKLIST

A step-by-step guide to ensure proper deployment of your wireless LAN:

QuickLink 37765
www.computerworld.com

THESE MOM AND POP COMPANIES HAVE WATCHED AND LEARNED FROM EARLY WIRELESS ADOPTERS. NOW THEY'RE THE ONES OUT IN FRONT, MAKING WIRELESS TECHNOLOGY CONFORM TO THEIR OWN UNIQUE BUSINESS GOALS.

BY STEVE ULFELDER

RICH LILLASH

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FEELS GERS

IT SEEMS LIKE ONLY yesterday that wireless applications were a big deal. Early adopters like Frito-Lay and FedEx were studied and revered; the risks and rewards of their pioneering wireless networks were pondered and analyzed. But you know what they say about pioneers — they're the ones with arrows sticking out of their backs.

Efforts by the FedExes and Frito-Lays of the world deserve to be praised, for they blazed the trail for today's wireless adopters — the smaller companies whose shirts bear no arrow holes. Here we take a look at some of those second-generation adopters to see what prompted them to go wireless, what tools they used and how the projects are working out.

NAPPI DISTRIBUTORS, PORTLAND, MAINE

INDUSTRY: Beverage distribution

REVENUE: $42 million

APPLICATION: Order entry tool from Vermont Information Processing Inc., Colchester, Vt.

BENEFITS: Lets sales force make more customer visits, cuts steps from order process, allows customers to better predict costs and is cheaper than the old telephone system

DRAWBACKS: Doesn't work well near radar

NAPPI'S SALESPEOPLE used to work in a fashion familiar to all 20th century road warriors: They would visit a customer, such as a liquor store in Kittery, Maine, write down order information, then call the orders in from a mobile phone or pay phone.

Back at headquarters in Portland, a representative would take the orders, enter them into Nappi's back-office systems (which run on an IBM AS/400) and print them out. Warehouse pickers used the printouts to fill orders for the next day's shipments.

As familiar as the process was, there was much that could go wrong. For starters, it wasn't unusual for Nappi's sales reps to overwhelm headquarters with calls. This resulted in lots of waiting around, which meant salespeople either cooled their heels at pay phones rather than hitting the road and visiting other customers or sat on hold on cell phones to the tune of 6.5 cents per minute. And those minutes added up for a relatively small business.

One day, a frustrated sales rep came into the office of Peter Paglio, Nappi's IT director, and said he had heard that another distributor in the area was using wireless computers to enter orders. "He was kind of a big talker, so I wasn't sure he was telling me the truth at first," Paglio says. "But he had a number for [Vermont Information Processing], so I checked it out."

Like many of the companies favored by second-generation wireless adopters, Vermont Information Processing is highly specialized: Its products and services are for beverage wholesalers. This niche approach makes sense, according to Gartner Inc. analyst Phillip Redman.

"To make wireless cost-effective, the vendors have got to know an awful lot about their clients' business processes," Redman says. "That's why you see so many adopters skipping a Microsoft or an IBM and going instead to specialist [vendor] companies in areas like transportation and warehousing."

Paglio says his first move was to make sure Nappi's sales territory was served by a carrier using the Cellular Digital Packet Data specification, which allows IP traffic to run on top of analog phone service. Nappi was in luck: AT&T Corp. offered the specification in "99.9% of our territory," Paglio says.

The distributor uses Symbol Technologies Inc. 1733 handheld devices with bar code scanners running the Palm OS operating system. The handhelds communicate with headquarters over the AT&T phone network at 9.6Kbit/sec.; Vermont Information Processing is tweaking its software to nearly triple that speed.

Sales reps now key in orders on the fly and send them straight to Nappi's IBM AS/400, where the next day's loads and schedules are determined automatically and sent to the warehouse for picking. Sales reps no longer call from pay phones, and office workers don't spend time keying in orders.

Paglio says the wireless system costs Nappi $800 per month to support all 32 of its sales reps; previously, the company paid $600 per month for 15 cell phones, plus toll calls from pay phones for the salespeople who didn't have phones of their own.

According to Paglio, the system has just a few drawbacks. "It goes wacky around radar" like that in use in airports and a local Naval base, he says. And some sales reps aren't crazy about a recent upgrade that offers more features but is harder to learn.

OLD DOMINION FREIGHT LINE INC., THOMASVILLE, N.C.

INDUSTRY: Transportation

REVENUE: $566.5 million

APPLICATION: Homegrown route-planning system for drivers

BENEFITS: Better service at loading docks, increased efficiency

DRAWBACKS: Drivers may have "Big Brother syndrome"

IS GETTING A STATUS BOOST over competitors sufficient reason to deploy a $3 million wireless application?

Actually, that's an exaggeration. Old Dominion has garnered numerous benefits from its 1,000 Symbol Technologies handhelds, including increased customer satisfaction, improved driver efficiency and a decrease in loading errors, says senior application development manager Barry Craver. He describes Old Dominion as a "super-regional" carrier, meaning that although the bulk of the company's freight is hauled in the Southeast, it has outposts nationwide.

But according to Craver, simply being equipped with real-time communication tools has increased the status of Old Dominion's drivers when they arrive at their stops. And that alone boosts efficiency.

"The service centers and shippers know which [trucking] lines have computers," Craver says. "That makes a difference — we've been bumped up in some places." That bump means less waiting in line, which translates into more stops per day.

The reason: When a trucker without a computer complains to his dispatcher that he's being forced to wait for service or a delivery, it's his word against the shipper's.

On the other hand, drivers with handhelds can prove where they are and how long, to the second, they've been idle. The end result for Old Dominion is less waiting around and more stops per driver per day.

The company used Microsoft Embedded Visual Basic to develop its own applications for the Symbol devices, which run Windows CE 3.0.

When it came to navigating the crazy quilt of U.S. wireless networks, Old Dominion turned to Aether Systems Inc. The Owings Mills, Md.-based vendor offers middleware and services

ON THE HEELS OF THE PIONEERS

that let companies outsource all or part of their wireless needs.

For example, while Old Dominion's application sends and receives transmissions between trucks and headquarters, Aether manages connections to the various wireless providers and is the entity billed by those providers.

In addition, Aether manages the overnight synchronization of drivers' handhelds. This saves money; Old Dominion uses the proprietary Ardis network from Reston, Va.-based Motient Corp., which charges by the character. The idea is to use real-time communication only where it adds value, as in proof-of-delivery messages.

Old Dominion is deploying another 1,000 handhelds, but don't expect all of its drivers to applaud.

In an unexpected benefit, the company has noticed a reduction in miles between stops among wireless-equipped truckers.

"We think maybe they got more efficient because there's a little more accountability there," Craver says.

Craver acknowledges that some drivers may resent the system's vigilant tracking of their whereabouts. However, office workers have grown accustomed to having their Internet use monitored by their employer, Craver says, and in the same way, he believes all Old Dominion truckers will accept the system over time.

THE F.A. BARTLETT TREE EXPERT CO., STAMFORD, CONN.

INDUSTRY: Landscaping

REVENUE: $120 million

APPLICATION: Mobile CRM tool for arborists, developed by in-house staff and SharpHat Inc. in Englewood Cliffs, N.J.

BENEFITS: Faster quotes for customers, competitive edge over smaller competitors

DRAWBACKS: No real-time communication yet, tough culture change for veteran employees

SOME COMPANIES DEPLOY mobile and wireless applications in an effort to emulate larger competitors. F.A. Bartlett did the reverse, using its relatively large size and budget to create an application few competitors could hope to match.

With nearly 100 offices throughout the U.S. and the U.K., F.A. Bartlett is a relative giant in an industry composed almost entirely of mom and pop operations. But in early 2001, the landscaping company determined that it wasn't capitalizing on its size.

Standard processes were few and far between. In particular, the price quotes prepared by sales staffers (called arborists) were "all over the place," according to David Andry, the company's vice president of IT.

Most arborists took notes by hand when visiting clients and prospective clients, then handed off those notes — eventually — to an assistant. As much as two weeks might pass between the time of a visit and the time a quote was mailed out. That translated to lost revenue as prospects cooled off and met with competitors.

Moreover, the language used by arborists in their quotes varied widely. This meant F.A. Bartlett ran the risk of not meeting widely accepted industry guidelines — in the landscaping industry, terms used to communicate with customers are mandated by the Manchester, N.H.-based Tree Care Industry Association (TCIA). The loosey-goosey way F.A. Bartlett prepared quotes made it impossible for headquarters to be certain that employees were following the rules.

F.A. Bartlett decided to standardize its arborists' work by equipping them with Fujitsu Stylistic LT C500 mobile pen tablet computers. Then it had to develop a software application for customer visits.

"I would have preferred an off-the-shelf application," Andry says, but there was nothing on the market that met company needs.

According to Isaac Ro, an analyst at Boston-based Aberdeen Group Inc., it's just a matter of time before a vendor fills that void.

"The wireless [vendor] companies that are most successful serve an incredibly tight niche," due to the need to understand business processes before building applications, Ro explains.

He points to Oilspace Inc., a New York-based company focused on petroleum trading, and Telispark Inc., an Arlington, Va.-based supply chain specialist, as examples.

F.A. Bartlett pulled together a 10-member committee with representatives from several regions. They drew up a list of desired features and functions, then turned the project over to a team composed of in-house developers and SharpHat representatives.

The application was developed and refined over a one-year period. In late 2001, it was rolled out to F.A. Bartlett's 200 arborists.

Today, arborists turn around quotes not in weeks, but in about three minutes, and their vehicles are equipped with mobile printers. Andry says the ability to present a quote immediately after a consultation has "significantly" increased business.

Moreover, arborists have a number of new tools to help them close sales. A glance at their Fujitsu devices shows them maps of clients' properties and offers a history of services performed, down to individual trees (customer information dating back seven years was loaded into the system).

Arborists can see if customers are current on their accounts. They can offer white papers written by experts at F.A. Bartlett's laboratory in Charlotte, N.C. They're even reminded of the names of clients' kids and pets.

All quotes are presented in TCIA-approved language, ensuring that the company meets industry language standards.

F.A. Bartlett says it spent approximately $1 million on the application, which it predicts will pay for itself in about four years through reduced paperwork costs and increased revenue.

The application isn't perfect, Andry acknowledges. For starters, there is no real-time communication between the mobile devices and headquarters — it was simply too expensive. But Andry says F.A. Bartlett is "absolutely revisiting that," and the company expects to have a pilot in place before the end of this year.

Today, arborists place their handhelds in cradles overnight. Through a Microsoft .Net Web services application, the day's data is replicated to a server at F.A. Bartlett's headquarters. The company uses Windows 2000 and Oracle Corp. database and CRM applications.

The other lesson learned, Andry says, is that persuading longtime arborists to use a modern mobile tool isn't always easy.

"There are so many personalities in this business," he says. "The company as a whole thinks it's great, but it's been a real culture shock for some people."

Ulfelder is a freelance writer in Southboro, Mass. Contact him at sulfelder@charter.net.

Advertising Supplement

IT Careers: Utility Industry Focuses on Cost-Cutting, Security

Command and control centers. Large-scale integration. Cyber attacks. It's not just the stuff of national defense and homeland security. These three areas, along with intense cost pressures, are the primary focus of information technology efforts across the utility industry. Better than 60% of utility companies experienced cyber attacks in the second half of 2002. The cost pressures are extensive, relying on technology to produce greater efficiency. And the grid generating and transmitting energy is aging. It's a mix that is ripe for technology solutions.

According to Becky Blalock, senior vice president and chief information officer for The Southern Co., these issues are coupled with what lies ahead. She adds to the list wireless networking, the ability to add 60-90,000 customers per year with technology instead of people, and power line carrier technology that will provide high speed Internet to rural areas.

Blalock and Southern have weathered the past two turbulent years continuing to invest in new technology, despite budget cuts, through aggressive negotiations. The $10.55 billion utility based in Atlanta is currently implementing enterprise application integration. The new system, which will be fully operational in 2006, provides real-time energy trading capability while also providing command and control over the supply chain to include everything from warehousing to freight management. As part of the project, a new accounting materials and procurement system will drive down changes to the work-order applications.

"What has been bad for the IT industry (as a whole) has allowed us to continue investing," Blalock says of Southern's strategic application of IT to business issues. "Our per bill cost is among the lowest in the industry. We've brought on systems that help our generation business do a better job of predictive maintenance, to assure we stay up and running. We're looking at systems to help grow our business, For instance, we acquired a gas company that was outsourcing a lot of IT and not very effectively. We're working to improve that."

Critical IT talent has been core to this technology strategy. Blalock is clear that she's looking for people who not only have a good education record, but also people who have proven they are creative and innovative leaders with high ethics. "I tell new hires, congratulations on getting an educ tion, but *keeping* one is the issue," she says. "Every day ha· to be a study of the business."

That's why Blalock's staff not only develops technology bu also spends time with field crews on the transmission and distribution side of the business and in power plants learr ing the generation side of the business. She believes this systemic approach allows Southern's IT group to serve as a breeding ground of business talent.

IT Careers

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Computer Programmer, 40hrs 9a-5p, Prgmg & converting Real Estate & relocation prgms to Turkish; creating & updating Turkish & English websites; debugging network problems; installing new additions in Turkish to d/base; dsgn hardware & s/ware to communicate in Turkish. Must possess Bach in Comp. Engg or equiv 2 yrs exp in job offd or 2 yrs exp in related occup. (Systems Analyst or equiv) Must be fluent in Turkish & English. Send resumes to: Alex Haider, Skyline Properties, Inc., 10 Magazine St., Cambridge, MA 02139.

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Systems Analyst - Bachelors Degree in Computer Science and Education; Experience in coding/ using Trillium,SAP R/3, student information systems, budgeting systems, purchasing systems, ERD, system design, SQL,OO,VB, HTML,Java,COBOL,C,Access,. Will be responsible for requirements Analysis, system design and implementation of school information systems.
All candidates must have proof of legal authority to work in the US permanently. Please send resume and cover letter (no calls) to Roma Trakru; InfoBridge, Inc., 1118 Surrey Dr., Glen Ellyn, IL 60137.

Quality Assurance Analyst. Develop & execute test plans & test cases. Conduct black box, white box, regression, usability, load, performance, & stress testing using SQL Server, TestPartner, Rational Robot, JMeter and InCtrl5 for automated testing & Bugzilla for defect tracking. Must have Bachelor's in Comp Sci, Bus, Info Sys or related + 6 mos exp as QA Analyst or Prog. Analyst, incl 6 mos exp testing web-based applications. Must have exp writing test plans & test cases, black box, white box, usability, load, & performance testing, knowl of SQL Server & automated testing tools. Send cover ltr, resume & salary req. to: Fiserv AIS. Attn: HR, 4200 University Ave. Suite 400, West Des Moines, IA 50266. Fiserv Advanced Insurance Solutions is an Equal Opportunity/ Affirmative Action Employer.

Web-based company seeks Senior Web Developer. Individual will design, develop and implement software for company Web sites; troubleshoot, debug and implement software code; rely on limited experience and judgment to plan and accomplish goals; perform a variety of tasks and work under general supervision of the company president. Must have a minimum of a bachelor's degree in software engineering or related field. Must have at least four yrs experience in computer programming or related field. The required experience must include the following: at least one yr. experience working with traffic log reports; two yrs. exp. in data manipulation, data mining, and source control CVS; three yrs exp. working with Apache, Perl, Java (includes servlets, applets, JSP and signature classes); four yrs exp. in database design and maintenance, GUI, SQL querying and command-line unix, as well as Linux & unix admin. Must also have Brainbench certification. Only persons authorized to work permanently in the United States need apply. Competitive wages. Hours are 8:30 am to 5:30 p.m. Please forward all resumes to Tom Harper, P.O. Box 23539, Louisville, KY40223. EOE.

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Send resume to: Human Resources, MSYS, Inc., 104 Iowa Ln., Suite 201, Cary, NC 27511. E-mail: info@msysinc.com.

Software Specialist II. Analyze & validate system requirements for proprietary insurance software applications using web-based technologies such as JAVA, Hypertext Markup Language, & Extensible Markup Language. Perform coding & data conversion activities, conduct performance testing, & provide technical support to ensure that systems & customer requirements are met. Identify potential problems with application systems performance, file structures, databases & systems integration, & Interact with Information Systems personnel & users to provide technical solutions. BS in Computer Science, Eng., Math, related field, or equivalent as determined by a foreign credentials evaluation service, & 2 yrs exp. in job offered or related occupation. Exp. must include JAVA for web-based development projects. Applicant must be bondable & drug screening required. 40 hrs/wk., $65,000/yr. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 215 Watson Powell Jr. Way, #100, Des Moines, Iowa 50309-1727. Please refer to Job Order No. IA1101728. Employer paid advertisement.

Sr S/W Engineer to lead teams, provide in depth analysis, design, development & testing services for database development projects; perform project scooping, project planning, project time/cost schedules, quality of deliverables and study & evaluate new technologies & methodologies; provide technical & business guidance for complex user problems; evaluate team members, guide team by providing methodologies; interact with clients on project related issues. Require M.S or foreign equiv in CS/Engg (any branch) with 3 yrs of exp in IT. B.S. or foreign equiv in CS/Math/Business/Engg (any branch) with 5 yrs of related progressive exp will also be accepted. High salary, F/T. some travel involved. Resumes: HR, Opal Soft, Inc. 3150 Almaden Expwy Ste 205, San Jose, CA 95118.

TECHNICAL SUPPORT ENGINEER. Responding to customer requests of med to high complexity, rsrchng customer issues utilizing the product documentation & support tools available, reprdcng reported behavior in a test environment, & working w/ other members w/in Techn Support to ensure timely & complete resolution of customer questns. & issues. Responsible for completion of any necessary follow-up on resolution, inclg logging of defects & enhancement requests against both the product & documentation to prevent service requests. Contribute to the Techn Support knwldge base by authoring value-added Alerts, FAQs & Technical Notes. Work on specific projects under the direction of sr. member or program mgr. Req: Master's deg or equiv. in CS, CE, EE, Computer Science Applications, or rltd. No experience necessary. Sal: $60,000/yr. Jobsite: Burlington, MA. 8am-5pm, 40hrs/wk. Send two (2) copies of your resume to: Case #200201332, Labor Exchange Office, 19 Standiford St, 1st Fl., Boston, MA 02114. Must have proof of legal authority to work in U.S.

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SOFTWARE ENGINEER to research, design, develop, implement and test application software in C/C++ and DataCore SANcentral DevSuite (SCDS) in Windows environment for storage management software; write Snap-Ins using COM in Microsoft Management Console; SCSI, TCP/IP and UDP protocols; I/O subsystems, software drivers, operating systems and storage area network. Require: M.S. in Computer Engineering and six months experience in the job offered or in research, or any experience providing skills in described duties. Full time or equivalent part time experience, before or after obtaining M.S., will be acceptable. Competitive salary and benefits, 9 am to 6 pm, M-F. Apply with resume to: Principal Factotum, Datacore Software Corporation, 6300 NW 5th Way, Fort Lauderdale, FL 33309. Only those meeting above listed qualifications need apply (Ref. #A).

NT Server Systems Administrator, Wachovia Corp. San Francisco, CA. Provide centralized systems admin., operational support & problem resolution for Intel based system for approx. 200 Intel servers. Reqs. BA w/ at least a Minor in Computer Science 1.5 yrs. exp. in the position offered or as a Network Consultant. The 1.5 yrs. must incl. work with Windows NT and Windows 2000 network and server design, Compaq server and storage equipment, Microsoft Exchange design and admin. as well as Proxy server and IIS design and implementation and work in an Enterprise env in the legal or banking industry Must be MCSE and Certified Novell Administrator in at least Novell 4 11 M-F, 40hrs/wk, Send resume to Randall Buck, Wachovia Corporation, 1525 West W T. Harris Blvd NC 0775, Charlotte, NC 28288-0775. No phone calls please.

NOTICE OF DISPOSITION OF COLLATERAL

Secured Parties:
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Davis Graham & Stubbs LLP
1550 17th Street
Denver, Colorado 80202
(303) 892-7324

Hambrecht & Quist Guaranty Finance, LLC
c/o Ted R. Sikora II
Davis Graham & Stubbs LLP
1550 17th Street
Denver, Colorado 80202
(303) 892-7324

Debtors:
Maxoptix Corporation, a Delaware corporation
Peak Storage Solutions, Inc., a Delaware corporation
Maxoptix Solutions, Inc., a Delaware corporation

The Secured Parties will sell tape library finished goods, WIP, electronic testing equipment, office furniture, accounts receivable, intellectual property, tooling and all General intangibles and all other property and assets of the Debtors to the highest qualified bidder in a public sale as follows:

Day and Date: May 16, 2003
Time: 10:00 am local time
Place: Omni Interlocken Resort Colorado
Fir Room
500 Interlocken Boulevard
Broomfield, Colorado 80021

• The terms of sale will be cash, cashiers check or wire transfer of immediately available funds.
• The Secured Parties reserves the right to credit bid.
• If the Secured Parties are the highest bidders and a deficiency remains, the Secured Parties reserve all rights and remedies with respect to other assets of the Debtors.
• The sale shall be in parcels or as a unit as determined by the Secured Parties.
• There is no warranty relating to title, possession, quiet enjoyment, merchantability or fitness for a particular purpose or the like in this sale.
• The Secured Parties reserve the right to refuse any bid, or postpone or cancel the sale.
• Inspection of the property will take place on May 13 and 14, 2003 at 246 S. Taylor Street, Louisville, Colorado 80027 and 3342 Gateway, Fremont, California 94538. Inspection shall be by appointment only. Contact Ted R. Sikora II (303) 892-7324 to make an appointment.
• All bidders must pre-qualify at least one (1) day in advance of the sale as to their bona fide interest and capacity as purchasers. Contact Ted R. Sikora II, (303) 892-7324 no later than noon on May 15, 2003 with pre-qualification information and notification.

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GLOBAL DIRECTOR OF INFORMATION TECHNOLOGY - Responsible for directing and coordinating research and development of information technology applications for medical laboratory services provider. Mail resume to Esoterix Inc., Attn: Human Resources, 4509 Freidrich Lane, Bldg 1, Suite 100, Austin, TX 78744.

Engineering Programmer sought to convert engineering specifications and statement of problems to detailed logical flow charts for coding into computer language for developing geo-science programs, and related duties. B.S. in Science or Eng., and related experience required. Send resume to Infologic, Inc., 8701 New Trails Drive, Suite A, The Woodlands, TX 77381.

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Technological Analyst- Analyze office technology infrastructure. Determine user needs versus systems capacity. Research, test, evaluate, & recommend hardware & software. Oversee installation of communications hardware. Provide user support regarding deta communication issues. Must have a Bach. Deg. in Comp.Science, Math, or a quantitative science,2 yrs. exp. in the job offered or in a network admin. occup. & knowledge of DHCP, WINS, & TCP/IP. Send resume to: Rachel Kirsch, Oliver, Wyman & Co., 99 Park Ave., New York, NY 10016. No phone calls/emails.

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The successful candidate will conduct research and software development in the areas of efficient mathematical subroutine libraries and performance analysis tools for high performance computing architectures. The job will focus on optimizations for the memory hierarchy and pipelined functional units of superscalar processors and on development of a low-level infrastructure for hardware performance monitoring of parallel programs. The position requires a background in numerical mathematics including linear algebra, as well as in computer architecture, systems-level programming, and parallel programming, and a master's degree in Computer Science or a closely related field. Programming skills should include C, C++, Java, Perl, and Fortran 90, as well as multithreaded programming and MPI. Knowledge of computer and network security is also required. 40 hrs/wk.

Send cover letter and CV to Dr. Shirley Moore, University of Tennessee Computer Science Department, 203 Claxton Complex, Knoxville, TN 37996-3450. Ref. Code: TN-YHH. Please visit our web site at http://icl.cs.utk.edu/announcements.html for more information. UTK is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services.

Senior Windows Software Engineer-Play a leading role in designing 32 bit Windows application software using Visual C, Visual Basic, Active X, Open GL, ODBC and Access Database management tools. Research, design and develop computer software systems, Analyze software requirements to determine feasibility of advanced software designs. Consult with engineering and technical staff to evaluate interface between hardware and software. Use GPIB and RS 232 ports. Requirements include a Master's Degree or equivalent in Electrical Engineering or related Engineering field and three years of work experience in the job offered or related field of Windows software design engineering, or in the alternative, a Bachelor's or equivalent in Electrical Engineering or related Engineering field and five years of progressively responsible work experience in the job offered or related field of Windows software design engineering. Applicants must have unrestricted authorization to work in the United States. Salary $67,830/year. 40 hours/wk, Respond with two copies of resume to Case #200201418. Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

RHODE ISLAND SUPREME COURT
JUDICIAL TECHNOLOGY CENTER

Senior Oracle DBA

Job Description

- Minimum of FIVE years employment experience as an ORACLE data Base Administrator (DBA).
- Demonstrable competence in Oracle SQL, PL/SQL, Oracle DEVELOPER 2000, Unix Operating System, Windows NT 4.0 Server Operating System.
- Requirement of at least a BS in Information Systems, Computer Science or Electrical Engineering and at least 7 years relevant experience as a software engineer, programmer or programmer analyst.
- Experience with the management of database management professionals in a team environment.
- Experience with the development of policy and procedures as they relate to database maintenance, security and archiving.
- Experience with ACS/SCT Banner Courts desirable
- Salary Range: $67,060-77,867

Contact: Tracy E. Williams, Executive Director, RI-JTC
401-222-8360; Fax: 401-222-2870

See www.ricourts.com for a full job description.

Lead Developers/Software Engineers needed. Seeking candidates possessing MS/BS or equivalent and relevant work experience. Part of the req. rel. work exp. must include 1 year using Java and Unix. Duties include: Design, develop, implement software systems; analyze software requirements; direct testing procedures. Work with RUP, Rational Rose, J2EE, Together J, Java and Unix. Mail res., ref. and salary req. to: Global Software Development Services, 10 South Fifth Street, #600, Minneapolis, MN 55402.

Sr. Database Admin. Design, analyze, test, maintain & improve logical & physical databases. Responsible for backup, recovery & tuning of databases. Calculate optimum values for database parameters & system analysis. Use Oracle, SQL server, &/or related skills. Req 4 yrs exp in job/4 yrs exp as Systems Analyst & Consultant or Asst. Syst. Anal. Or Sr. Programmer & Programmer. Jobsite: West Greenwich, Rhode Island. Send ad & resume: Yen C. Chong, Amgen Inc., One Amgen Center Dr., Thousand Oaks, CA 91320-1799. Include Ad# 02-412FV.

Software Specialist II. Analyze & validate system requirements for proprietary software applications developed for intranet presentations using web-based technologies such as Websphere Application Developer, JAVA, Hypertext Markup Language, Extensible Markup Language, & JSP. Perform architectural design activities including installation & maintenance of servers & reviewing of application design processes; conduct necessary coding & data conversion activities, create graphical user interfaces, conduct performance testing, & provide technical support to ensure that systems & customer requirements are met. Identify potential problems with application systems performance, file structures, databases & systems integration, & mentor Information Systems personnel & users in use of applicable technologies. BS in Computer Science, Eng., Math, related field, or equivalent as determined by a foreign credentials evaluation service, & 2 yrs exp. in job offered or related occupation. Exp. must include use of object-oriented technologies such as JAVA, Websphere, AS/400 & JSP in a web-based environment. Applicant must be bondable & drug screening required. 40 hrs/wk., $62,400/yr. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 215 Watson Powell Jr. Way, #100, Des Moines, Iowa 50309-1727. Please refer to Job Order IA1101727. Employer paid advertisement.

Software Engineer II: resp for using MS Visual C++ & cross-platform compatibility tools to design, code, test & doc't new & existing sftwr for Windows NT/XP & Solaris op syst. Work as member of tech eng'g team; engage in prod planning, design & testing activities; prepare detailed designs w/object-oriented sftwr devel techs; measure & analyze syst performance capabilities; participate defining sftwr design specs & syst parameters; code & debug sftwr modules from design & syst eng'g specs; & recommend eng'g solutions to complex hrdwr/sftwr issues involving interface design, syst eng'g & overall syst arch. Make tech presentations. Min. req's: B.S. in Comp Eng'g, Elec Eng'g or rel eng'g discipline plus 2 yrs exp in job offered or in related sftwr devel pos or related occupation resp. for sftwr testing, design & coding. Knowledge of C++, UNIX & NT op systems & object-oriented sftwr devel tools & techniques req'd. Must have unrestricted authorization to work in U.S. M-F, 8:30-5:30, 40+ hrs/wk. Salary: $67,000-$90,000. An EOE. Send 2 copies of resume to Case # 200201367, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

Software Engineer (multiple openings). Job site: Industry, CA. Send resume to Attn: Charles Holms, Recruiting Specialist, Mitutoyo America, 965 Corporate BL, Aurora, IL 60504. No phone calls please.

Programmer Analyst/Software Engineers needed. Seeking candidates possessing BS or equivalent and relevant work experience. Part of the req. rel. work exp. must include 3 yrs. using COOL:GEN/IEF, DB2 and COBOL. Duties include: Design, develop, software applications; analyze application support; plan, test and maintain systems. Work with DB2, REXX, INSYNC, COBOL, and COOL; GEN/IEF. Mail res., ref. and salary req. to: Global Software Development Services, 10 South Fifth Street, #600, Minneapolis, MN 55402.

Bing Group is looking for quality/system analyst, programmers. We require at least Bachelor degree. Responsible for system analysis and system / IT project quality assurance, using JavaScript, ColdFusion, Dream Weaver. Please send resumes to lwilson@binggroup.com. EOE

Programmer/System Analysts, Software Engineers and IT professionals wanted by Software Associates. Candidates must have BS. Exp. of Oracle, VB, SQL, Java, C/C++ is a plus. We are small but growing. Please email your resume to: info@softwareassociate.com. EOE

Prog. Analyst: Assist in planning, developing, testing & Doc. S/W progs in SAP R/3 ABAP/4 for Interfaces, Conversions & Enhancements & using C++ & Oracle. Reqd: Bachelors in Comp. Sci., Comp. Engg. or Elect. Engg. 40hr-wk. Job/Intv Site: Oakbrook, IL. Send resumes to Futuretech Consultants LLC, 1415 W 22nd St., Towerfloor, Oakbrook, IL 60523.

Software
Data Conversion Specialist

Data Conversion Specialist, 40-hr wk, 9AM-5PM. Associates or foreign degree equiv in computer science + 2 years in job offered or 2 yrs as Systems Analyst. Provide technical skills to ensure a successful, quick and accurate conversion of data from all systems; provide input to the detailed implementation project plan; provide a channel of communication with implementation and support to representatives; keep specifications current throughout the projects; work with client representatives to determine specifications for data mappings including analyzing source data, writing SQL queries; develop, test and implement automated data conversion routine including programs for extraction, transformation and loading of data to the new database using Visual Basic and SQL or FoxPro. Submit resume to: jobs@campusmgmt.com or Joe Bozza, HR Director, Campus Management Corp, 777 Yamato Rd, #400, Boca Raton, FL 33431.

Computer Graphics Specialists needed for video game development company in Chicago, IL, to develop computer graphics animation. Use 3D graphics software to design/edit integrated videos, animations, stills, images, textures, plug-ins and special effects with computer graphics applications. Requires Bachelor's degree in Computer Art or Graphics Design with coursework in key frame animation. Mail resume and demo reel to Nicholas Ehrlich, Studio Gigante, Inc., 1327 West Washington Blvd., Chicago, IL 60607, referencing job code CGS. EOE

Prog/Analysts to analyze, develop/maintain B2B appls in client server envir using Java, Servlets, Java Beans, JHTML, JScript, VBScript, JDBC, Apache, ATG Dynamo, Oracle, etc under UNIX/Windows OS; design/develop Java applets, run batch process to generate reports; perform code development, quality control testing and performance tuning. Require: B.S. or foreign equiv. in CS/Engg.(any branch) & 2yrs of exp. in IT. F/T. Travel Involved. Comp. Salary. Respond to: HR, Opal Soft, Inc., 3150 Almaden Expy, Ste 205, San Jose, CA 95118.

Venturi seeks DB App. Engr. for Kirkland, WA office. DESC: Prov. on site comp. sys. consulting to max. info. sys. capability & efficiency; dsgn, dev, impl, & deploy RDBMS & multi-tiered apps. util. SQL, C/C++/C#, Java, VB, & Win. Construct info. sys. framewk & architecture to facilitate access to data util. SOAP, XML, XSL/XSLT, & XPath. REQ: BS in Engr, CS, Math, or Physics or equiv. + 5 yrs. exp. dsgn, dev, impl, & deploying RDBMS & apps. util. SQL, C/C++, Java, VB, & Win. Plus 1 yr. exp. constructing info. sys. framewk & architecture to facilitate access to data util. SOAP, XML, XSL/XSLT, & Xpath. Prem. sal. + benes. Pls. reply to J. King, Job# VT-104, 11255 Kirkland Way, Kirkland, WA 98033.

Software Engineer needed in Bank's J2EE Development Group. Requirements: B.S., expertise in all phases of software development life cycle, and ability demonstrated on the job to design, develop, implement and test the technical components of n-tiered E-commerce applications, using J2EE, Oracle, OOAD, and mainframe connectivity/communication skills. Competitive salary and benefits. Send resume to HR, Webster Bank, 10 Main Street, Bristol, CT 06010 or email Surcinas@websterbank.com. An Equal Opportunity Employer.

Sys/Analysts to analyze, design appls using Java, VB, JScript, VBScript, HTML, Oracle, DB2, ASP under Windows/UNIX OS; responsible for project planning, time & cost schedules, quality of deliverables; study/evaluate new tech/methodologies; provide tech/business guidance for complex user problems; provide methodologies to follow; interact with clients. Require: Master's or foreign equiv in CS/Engg(any branch)/Business Admin. High Salary. F/T. Travel involved. Resume to: HR, Salem Associates, Inc., 405, 6th Ave., Ste 102, Des Moines, IA 50309.

Computer Junior Programmer. Collect info to help Sr. Info. Sys. Analyst to install, configure & maintain information systems on WIN server to resolve Net BIOS names in IP address. Asst. technical team for installation, configuration & connectivity w/lease line of 64 KBPS w/ISP to its existing network including Windows NT 4 & Linux Servers. Req: Bachelors in Busn. Admin. w/exp. in Info. Sys. 40 hrs/wk. Job/Interview Site: Woodland Hills, CA. Send resume to Technocrat Solutions Inc., 21031 Ventura Blvd., #420, Woodland Hills, CA 91364.

Infogen is seeking IT professionals. Req. BS. Skills In following area are plus: Oracle9i, Weblogic / WebSphere, C++, Visual C++, VB, COM, STL, MTS, MSMQ, ASP, Java, HTML, XML, MTS, MSMQ, ADO, UML. Travel is required. Send resume to infojobs@infogeninc.com.

Options and Resources is a health care staffing & resources management company, looking for computer programmer analysts, web designers, imaging specialists. Candidates must have BS plus experience. Attractive wage / full benefits. Apply at: cmadison@optionsandresources.com

PROGRAMMER ANALYST

Pharmacy on-line services. Prepare & maint. applications for on-line operations. Develop & maint. software/hardware systems, Mail-Order Rx and Med. supplies database. Perform preventive maint. Generate reports, invoices & follow-up claims inquiries. Prepare bids & documents for off-site mgmt contracts. Pays competitive salary w/benefits. Req: B.S. in Computer Science & MCSE+2 Yrs exp. Knowledge of FSI & QS/1 systems. Pharmacy Tech Lic pref. Apply w/CV to:
Parkview Med Plz Pharmacy
3975 Jackson St #109
Riverside, CA-92503
email: rameshrx@aol.com

Software Design Engineer wanted. Develop software programs including operating systems, applications and/or network products for external use. Develop project plans, functional specifications and schedules for wireless air-interfaces (GPRS, GSM), DSP and multimedia applications. Designs and performs analysis on programs and systems. Bachelor's degree in Science or Engineering and two year related expenence required. Send resume to HR, Microroad Corporation, 14205 SE 36th Street, Suite 100, Bellevue, WA 98006

Deluxe Laboratories, Inc. is seeking a Vice President, Information Technology for Hollywood, CA. Candidate will develop and direct IT department which will design and implement security for copyright protection of 35mm commercial feature films to local distributors. Will use knowledge of 35mm commercial feature film distribution patterns and film costing models to direct IT department which will set production schedules to meet distribution scheduling and pricing demands. Will develop, implement and direct IT department of chemical batch manufacturing company which requires real time bar code tracking of raw materials and finished product and SLA production operating ability of 99.9% or greater. Will select all relevant criteria of employees including creating job duties, salary, training and performance criteria and will be responsible for the hiring and firing of employees in IT department. Will direct IT department which will integrate manufacturing computer systems and software to interact with business computer systems and software to insure that tracking of product, billing, raw material inventory, production schedules and shipping are coordinated in real time. Will develop and implement structure of organization including infrastructure, LAN, networking communications, help desks, applications developments and select appropriate application software in an IDE (Interactive Development Environment) to insure quality assurance, configuration management and distribution schedules meet required goals. Email resumes to cindy.snavely@bydeluxe.com. No phone calls please.

SOFTWARE ENGINEER to design, develop, implement, test and maintain web-based application software using Java, EJB, JSP, Servlets, XML, WebSphere Application Server, ClearCase, Oracle and Visual Age for Java under Windows and UNIX operating systems. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with five years of progressively responsible experience in the job offered or as a Systems Analyst. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Murli N. Reddy, President, Charter Global Services, Inc., 5445 Triangle Parkway, Suite 190, Norcross, GA 30092; Attn: Job SA.

Programmer Analysts - Design, Develop and Maintain Enterprise, Web, and Portal applications in Java and/or VB Min Edu-BS in Comp.Sc./Engg or equi, Min Exp - 2 yrs. Job may involve working at various locations throughout the US. Please send resumes to Attn: RR, 1022 East Divide Ave Suite D, City of Bismarck, ND 58501.

SYSTEMS ANALYST to analyze, design, develop, test, implement, maintain and support business critical credit card application software using JCL, COBOL, DB2, File-Aid, VSAM, Xpediter, Infoman, Changeman, ProEdit, Platinum Product and Connect Direct on MVS/ESA and OS/390 platforms. Require: B.S. degree (or equivalent work experience) in Computer Science/Engineering, or a closely related field with two years of experience in the job offered. Competitive salary offered. Send resume to: Sandra A. Ricks, Citibank Universal Card Services, 8787 Baypine Road, Jacksonville, FL 32256; Attn: Job VJ.

COMPUTERS

V Group, Inc. seeks computer professionals local and nationwide. All positions require B.S. or equiv in Comp Sci/Engg/Math/Info Sci with at least 4 yrs exp or M.S. or equiv with at least 2 yrs exp in above field(s) unless specified otherwise.

Software Engineers/Programmer Analysts (Multiple Positions): Research/ design/ develop/ test comp software systems using C / C++ / Java / Visual Basic / J2EE / EJB / JSP / Servlet / XML / Apache / Tomcat / ASP / .Net / Oracle, PL/SQL /EDI / Gentran / Mercator, Informatica / Cognos / Business-Objects / Datawarehousing, WebLogic / WebSphere, AS 400

Database Administrators (Multiple Positions): Create, Maintain, Monitor or Migrate Databases. Backup & Recovery, tuning. Experience in DB2 / Sybase / Oracle / PeopleSoft / Oracle Apps / SAP basis apps.

ERP / CRM (Multiple Positions): PeopleSoft, Oracle Financials, Siebel, SAP, Clarify

Network / Unix Administrators (Multiple Positions) Win NT/2000/ XP (Proxy, Exchange, DNS, DHCP, IIS, WINS, RAS, LDAP). Solaris, AIX, HP-UX. Install, configure Cisco / 3Com Router, Switch, Hubs, Ethernet, VPN, ISDN, Frame Relay, Firewall, Shell Scripts, Floodgate, iPlanet. NIS+, NFS, ODS, LVM, Veritas

HR Dept
recruiting@vgroup.net
Fax: 877 874 8942
42-C Read's Way
New Castle Corporate Commons
New Castle, DE 19720

PROGRAMMER/ANALYST to analyze, design, develop, customize and support application software using Framme, FRS, RFMKT/NUC, RuleBase Builder (FRMKT/RB), Visual Source Safe, Oracle, Crystal Reports, Visual Basic (Active X) and Framme Field View on Windows NT/2000 and UNIX platforms. Require: B.S. degree in Computer Science/Engineering, or a closely related field with two years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Murli N. Reddy, Charter Global Services, Inc., 5445 Triangle Parkway, Suite 190, Norcross, GA 30092; Attn: Job DB.

Software Engineer
Assist in design & development of company's next generation Java-based applications. As part of Workforce Services team, will develop complex Java business projects, which will be deployed as both embedded client software & WEB-server servlets. Position rqrs taking initiative & working w/minimal supervision. Rqrs: BS in CS or a related field or equiv. & 1 yr of software product development experience. Also rqrs experience and/or knowledge w/object oriented Java design & implementation utilizing Java Servlets, Java Scripts, & HTML. 8a.-5p. 40 hrs/wk. $76,000/yr. Submit 2 resumes to Case # 200201377, Labor Exchange Office, 19 Staniford St, 1st. fl., Boston MA 02114.

VALIDATION ANALYST

Validate programs in a FDA regulated environment with the experience of 21 C.F.R. Part 11. Develop test plans, create and execute test scripts and document test results. Develop user acceptance testing, prepare user's manual, validate SOPs. Participate in internal audits. Work with tools Winrunner, Load Runner, SQA Robot, PL/SQL Triggers. 40 hours/week, 8:00 a.m. to 5:00 p.m., $55,000/year. Bachelor's degree or equivalent in Computer Science. *Must have proof of legal authority to work in the United States. Send your resume to the Iowe Workforce Center, 590 Iowa Street Dubuque, IA 52004-0757. Please refer to Job Order #IA1101721. Employer paid advertisement.*

OH Indus Distrib seeks Database Administrator to coordinate changes to corp. databases; create/review SQL scripts & stored procedures; schedule/review jobs & system performance; review backup/recovery strategy, disaster recovery planning, and long range database planning w/Microsoft SQL & Oracle; assist w/database design & modeling; develop models/ designs for data warehouse/data store/data marts; develop incremental and full load processes for data marts; develop data validation processes; plan/implement metadata repositories; perform migration; mentor/tutor jr. database admin. on performance tuning and monitoring of databases. Bachelors in Bus. Admin./Comp. Science (or equiv) and 2 yrs in-job/job related exp. req, including exp with: Oracle 8.x/7.x, SQL 2000/7.x/6.5, Windows NT and 2000/NT4, Ils 4.0/5.0, Microsoft ASP, MS transaction and cluster server, DHCP/DNS/WINS, T-SQL, Oracle PL/SQL, Erwin Embarcadero, ERStudio. Must be Oracle cert prof (developer 2000 track and 8i DBA track), and Microsoft cert database admin and systems engineer. Resumes (no calls) to HR Dept, One Applied Plaza, Cleveland, OH 44115. EOE.

SOFTWARE ENGINEER to design, develop, implement and maintain application software systems and databases using XML, XSL, ASP, JSP, HTML, DHTML, Visual Basic, Oracle Developer, sed, awk and shell scripts under UNIX, SUN Solaris and Windows operating systems; Design and develop stored procedures and triggers. Require: M.S. degree in Computer Science/Engineering, or a closely related field with two years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Send resume to: Murli N. Reddy, President, Charter Global Services, Inc., 5445 Triangle Parkway, Suite 190, Norcross, GA 30092; Attn: Job BA.

SOFTWARE ENGINEER
Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in WebLogic, WebSphere, ATG Dynamo, XML and JDK. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of WebLogic, WebSphere, ATG Dynamo, XML and JDK. Salary: $73,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Manager, Butler County CareerLink, Pullman Commerce Center, 112 Hollywood Drive, Suite 101, Butler, PA 16001-5699, Job No. WEB323495.

Senior Software Engineer

Senior Software Engineer needed in Birmingham AL., to lead a team of engineers to analyze user's requirement for improving existing systems, design software and/or recommend commercially available software solutions. Position requires 4 years experience working in Java, OO technology in a web based multi-tiered environment, and an MS in computer science or electrical engineering. Prevailing wage and benefits. Send resume to ComFrame Software Corp. at employment@comframe.com, or fax to 205/314-3415, or mail to 110 12th Street North, Birmingham, AL 35203.

Software Engineer
Develop complex, multi-tiered applications, especially Internet applications & to design & troubleshoot at all stages of development. Interact w/customer to understand & deal w/any potential complications or special requirements. In developing application, formulate & develop application design using object oriented analysis & design techniques, develop & deploy design under operating systems UNIX or NT, as well as conduct application engineering & assist customers in writing applications using assorted tools. Some travel may be required. Rqrs: BS in CS, Engineering, or related & 2 yrs exp. in position or related. Also rqrs knowledge in server side Java or C++; knowledge in developing in UNIX or NT; & knowledge in development using object oriented analysis & design techniques. 8:30a.-5:30p. 40 hrs/wk. $80,000/yr. Submit 2 resumes to Case # 200200169, Labor Exchange Office, 19 Staniford St, 1st. fl., Boston MA 02114.

COMPUTER/IT
Data Base Administrator. (Irvine, CA). Req. a Bach.'s degree or equiv. foreign educ. in CS, & 4 yrs.' exp in the job offered or 4 yrs.' exp. in database admin. using Adabas database mgmt. software, Natural programming language, & Job Control Language (JCL) in a mainframe environ. All stated exp. must involve: architecting client-server interfaces among multi-platform environments using Entire or EntireX; & installing & maintaining Entire or EntireX, Adabas, & Natural in multi-platform environments. Must be avail. to provide on-call support 24 hrs/day & 7 days/week. Engage in database admin. using Adabas database mgmt. software, Natural programming language, and JCL in a mainframe environment. 40 hrs/wk. Apply w/resume and salary history to: humanresourcesirv@zcsterling.com, ZC Sterling Insurance Agency, Inc., 9800 Muirlands Bl., Irvine, CA 92618. EOE.

SOFTWARE ENGINEER to design, develop, enhance and test web-based application software using Java, JSP, JMS, EJB, Servlets, JDBC, Java Beans, Java Swing, XML, Oracle, Rational Rose and BEA Weblogic under UNIX and Windows NT operating systems. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with four years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Kevin Barfield, Total System Services, Inc., 1990 Barrett Summit, Suite 200, Vaughn Rd., Kennesaw, GA 30144; Attn: Job LB.

Software Professionals: RS Software, a leading, globally positioned software development and consulting firm needs systems analysts willing to relocate to its client job sites nationwide with experience in analysis, development, modification and implementation of software systems using COBOL, JCL, VSAM and DB2 database in IBM mainframe environment.
Send resume to:
HR, RS Software (India) Ltd.
1900 McCarthy Blvd., # 103
Milpitas, CA 95035

Sr. Systems Engineer: oversee development of Internet-based software applications & solutions. Coordinate software development & launch projects for new users; provide tech. advice on integration & systems architecture issues; & use knowledge of server-side technologies/Java to develop new & enhance existing products. Use SQL Server & Oracle tools to launch & test applications; design & calibrate systems architecture for new software; define database layouts; develop systems according to client specifications. Min. req's: B.Sc. in Computer Science or related field + 4 yrs. exp. in job or as Software Engineer responsible for using Java, XML, HTML, JHTML, Java Servlets, SQL Server & PERL to develop software, database tools & Web/Internet-based applications & modules. Must have unrestricted authorization to work in U.S. M-F, 8:00am - 5:00pm, 40+ hrs/wk. Salary: $85,560.80-$105,000/yr. Send 2 copies of resume to Case # 200200210, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114. EOE.

Senior IT Specialist - Designs, develops, debugs, tests and deploys J2EE applications in both solo and team working environments. Analyzes client requirements. Provides technical advice and guidance to project team members, customers and sales teams. Utilizes WebSphere, Visual Age for Java, JSP, XML and Oracle. Assigned to various client sites throughout the U.S. Must have Master's degree (U.S. or foreign equivalent) in Computer Science or Engineering as well as either two years of experience in the job offered or two years of experience as a Systems Developer or Project Leader. Employer will accept a Bachelor's degree plus five (5) years of progressively more responsible experience in lieu of a Master's degree. 40 hrs./wk., 8:00 A.M. to 5:00 P.M., $85,000.00 p.a. Job Order Number WEB 319833. Applicants should send resume to the following address and must reference the job order number: Site Director, Pittsburgh/Allegheny County CareerLink, ATTN: ES Supervisor, 425 Sixth Avenue, Suite 2200, Pittsburgh, PA 15219.

OH Consulting Co. seeks Sr. SAP Consultant to assist in business development, strategy/planning sessions, design, test phases of projects; design optimized data model structure to analyze/report data extracted from source system; build data models to report online and/or analytical reports; integrate SAP BW with external systems for further analysis/planning; assist in creating specifications to design and extract data from the source system database tables. Min. Bachelor's Degree in Mech. Eng. or equiv and 2 yrs. exp. in job/job related req., including working knowledge in Business Information Warehouse (BW), ABAP/4, SAP Script, ALE/EDI, Production Planning, Quality Management and LIS. SQL Plus, PL/SQL, HTML. U.S. Travel req. Resumes to H.R. Dept., CCAI Consulting, 5800 Landerbrook Dr., Mayfield Hts., OH 44124.

AgreeYa Solutions is hiring all levels of Programmer/Analysts and Software Engineers. Sr. Software Engineers req a Bach deg/equiv & 5 yrs exp or Master deg/equiv & 3 yrs exp. Send resumes to 90 Blue Ravine Rd, #155, Folsom, CA 95630. Will be assigned to client-sites nationwide.

Systems Engineer

Union Bridge, Maryland: Maintain, support, improve and update the plant process control system and related application software and hardware to enable the maximization of system's capability. Work with operations personnel, suppliers and consultants to address plant performance issues, implement system improvements and upgrades. Train the Process Control Supervisors and control room operators. Duties involve daily usage of the following software, hardware and programming applications: PCS7, CFC, SCL, Simatic S7, WinCC, CEMAT, PDAS, PCAnywhere, Visio2000, Simatic S-7-416 PLC, ET200 Distributed Input/Output system, OLM, and NT based redundant servers. Requires: B.S. or foreign equivalency in Electrical Engineering and 2 yr of exp as a Systems Engineer or 2 yr of exp as an Applications Engineer. Exp which may have been obtained concurrently must include 2 yrs of experience with Simatic and CEMAT. EOE. 40hrs. 8:00-5:00 pm. Send resume (no calls) to: Mr. Hugh Earls, Manager, Human Resources, Lehigh Cement Company, 7660 Imperial Way, Allentown, Pennsylvania 18195.

Software Engineers

Software Engineers needed in Birmingham, AL. Position requires analyzing, designing, constructing and testing software. Experience in Java and OO technology for web based multi-tiered environment required. Must have BS in computer science or electrical engineering and 1 year experience in job offered; or MS in computer science or electrical engineering with no experience. Prevailing wage and benefits. Send resume to ComFrame Software Corp. at employment@comframe.com, or fax to 205/314-3415 or mail to 110 12th St. N., Birmingham, AL 35203.

Enterprise Solutions, Inc is hiring all levels of Programmer/Analysts & Software Engineers. Send resumes to 2118 Walsh Ave., Suite 230 Santa Clara, CA 95050. May be placed at client site nationwide.

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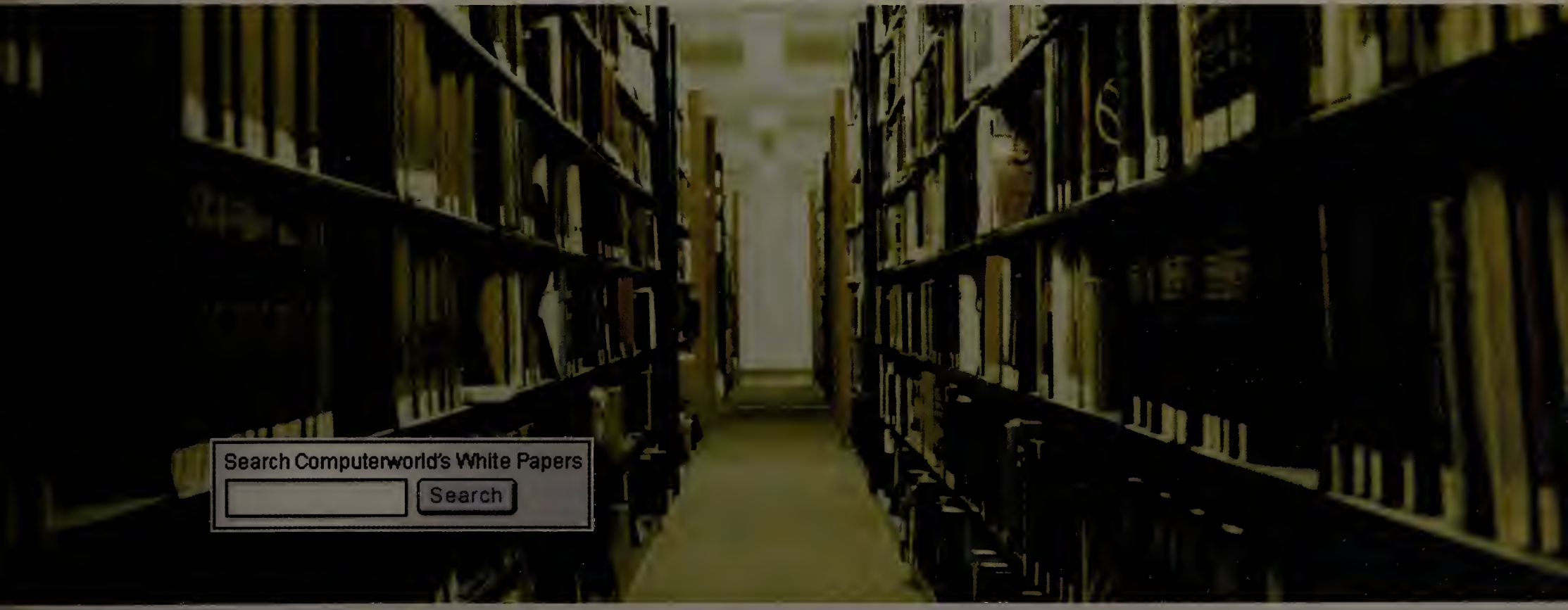

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Subscription rates: U.S., $190/year; Canada, $220/year; Central and South America, $250/year; all others, $295/year
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Page number refers to page on which story begins. Company names can also be searched at **www.computerworld.com.**

1-800-FLOWERS.COM INC 22
ABEROEEN GROUP INC. 44
AETHER SYSTEMS INC. 30,44
AIRESPACE INC. 40
ALTA ASSOCIATES INC. 1
AMERICA ONLINE INC. 6
AMERICAN HOSPITAL ASSOCIATION 19
AMERIQUEST MORTGAGE CO. 1
ARCH COAL INC. 38
ARUBA WIRELESS NETWORKS 40
ASCENSION HEALTH INC. 30
ASSOCIATION OF AMERICAN MEOICAL COLLEGES 19
AT&T CORP 1,44
AT&T FOUNOATION 1
AVAYA INC. 40
AVENTIS BEHRING LLC 8
AXA GROUP 10
BAKER & MCKENZIE 6
BEA SYSTEMS INC. 7
BENETTON GROUP SPA 30
BLOGGER.COM 23
BORLAND SOFTWARE CORP. 10
BROCAOE COMMUNICATION SYSTEMS INC 12
BURTON GROUP 42
CARNEGIE MELLON UNIVERSITY 30
CATERPILLAR INC 38
CE FRANKLIN LTO. 1
CELANESE CHEMICALS LTO. 30
CENTERBEAM INC 16
CHARLES SCHWAB & CO 7
CINGULAR WIRELESS 38
CISCO SYSTEMS INC. 1,12,30,40,41,42
COGNIZANT TECHNOLOGY SOLUTIONS CORP 16
COMPUTER ASSOCIATES INTERNATIONAL INC. 10
CORNING CABLE SYSTEMS LLC 14
CORNING INC. 14
CORPORATE EXPRESS INC. 8
CRISHELE CONSULTING 14
CSX CORP. 10
CSX TECHNOLOGY INC. 10
CURRENT ANALYSIS INC. 40
CUTTER CONSORTIUM 14,54
OANTZ OEVELOPMENT CORP. 8
OATA MANAGEMENT INSTITUTE 8
OATAQUEST INC. 8
OELL COMPUTER CORP. 12,30,40
OELOITTE & TOUCHE LLP 6,8
OTE ENERGY CO. 14
EBAY INC. 6
EMC CORP. 12
EMPRESAS POLAR 1
ENTERASYS NETWORKS INC. 41,42
ENTERPRISE MANAGEMENT ASSOCIATES INC. 10
ESOLUTIONS®CHAMPLAINCOLLEGE 18
FARPOINT GROUP 38,40,42
FEOEX CORP. 30,44,54
FIOELITY INVESTMENTS 30
FORRESTER RESEARCH INC. 30
FORTRESS TECHNOLOGIES INC. 40
FRITO-LAY INC. 44
FROST & SULLIVAN 30,40
FUJITSU LTO 40
FUJITSU PC CORP. 30,44
FUNK SOFTWARE INC. 40
GARTNER INC. 1,8,18,22,30,40,44
GENERAL MOTORS CORP 30
GLOBAL GRIO FORUM 7
GOOO TECHNOLOGY INC. 40
GOOGLE INC. 23
HANOSPRING INC. 40
HARVARO BUSINESS SCHOOL 14
HAWAIIAN ELECTRIC CO. 1,6,10,12,14,30,40
HILTON HOTELS CORP. 1
HUBBARO ONE 8
HUGHES, HUBBARO & REEO LLP 1
IBM 1,7,8,10,12,14,22,40,44
IDC 12,22,30,40
IMPACT BLUE INC. 8
INFORMATION TECHNOLOGY ASSOCIATION OF AMERICA 6
INFOVISTA CORP. 8
IN-STAT/MOR 22,30,40
INTALIO INC. 7
INTEL CORP. 14,41
INTERNATIONAL ASSOCIATION OF PRIVACY PROFESSIONALS 8
INTERNATIONAL ORACLE USERS GROUP 8
INTERNATIONAL TELEWORK ASSOCIATION & COUNCIL 1
IONA TECHNOLOGIES PLC 7
ITRONIX CORP. 38
J. CREW INC. 30
JETBLUE AIRWAYS CORP. 12
JOHNS HOPKINS UNIVERSITY 19
KINETIC WORKPLACE INC. 1
LEGATO SYSTEMS INC. 6
LIMITEO BRANOS INC. 30
LM ERICSSON TELEPHONE CO. 14
MANAGEMENT SOLUTIONS & SYSTEMS INC. 10
MERCURY INTERACTIVE CORP. 22
MERRILL LYNCH FINANCIAL OATA SERVICES INC. 14
META GROUP INC. 10,30
MICROSOFT CORP 1,6,7,8,10,12,22,44
MOBILE SATELLITE VENTURES LP 38
MOTIENT CORP. 44
MOTOROLA INC. 40
NAPPI OISTRIBUTORS. 44
NASOAQ STOCK MARKET INC. 14
NATIONAL INVESTMENT COMPANY SERVICE ASSOCIATION 14
NAVIGANT INTERNATIONAL INC. 1
NETIFICE COMMUNICATIONS INC. 1
NETMOTION WIRELESS INC. 42
NETOPIA INC. 1
NEXTEL COMMUNICATIONS INC. 40
NORTEL NETWORKS LTD. 14
NORTHRUP GRUMMAN CORP. 1
OILSPACE INC. 44
OLO OOMINION FREIGHT LINE INC. 44
ORACLE CORP. 1,8,7,8,10,44
ORGANIZATION FOR THE ADVANCEMENT OF STRUCTUREO INFORMATION STANOAROS 7
PALM INC. 22,40,44
PARAGON NETWORKS 8
PERE0RINE SYSTEMS INC. 14
PFIZER INC. 1
PRAOA. 30
PROXIM INC. 40,41,42
PRUOENTIAL SECURITIES INC. 14
RED HAT INC. 6
REOBACK NETWORKS INC. 14
REOMONK 8
REINSURANCE GROUP OF AMERICA INC. 16
RESEARCH IN MOTION LTO. 40
SAP AG 8,7
SCLOGIC INC. 42
SEARS ROEBUCK ANO CO. 22,38
SHARPHAT INC. 44
SIEBEL SYSTEMS INC. 7
SIERRA ATLANTIC INC. 16
SOLUTIONARY INC. 8
SONY CORP. 40
SPRINT PCS GROUP 40
ST VINCENT'S HOSPITAL 30
STARBUCKS CORP. 22,27
STORAGE NETWORKING INOUSTRY ASSOCIATION 8
SUN MICROSYSTEMS INC. 7,10
SWIFT TRANSPORTATION CO. 30
SYBASE INC. 12
SYMBIAN LTO. 40
SYMBOL TECHNOLOGIES INC. 30,38, 40,41,42,44
TARGET CORP. 30
TELISPARK INC. 44
TEXAS INSTRUMENTS INC. 30,42
THE F.A. BARTLETT TREE EXPERT CO. 44
THE REGENCE GROUP INC. 12
THE SCO GROUP 8
THE ULTIMATE SOFTWARE CONSULTANTS 6, 8
THE YANKEE GROUP 12
TIVOLI SOFTWARE. 12
TOOO SHIPYARDS CORP. 22,38
TOSHIBA CORP. 40
TRAPEZE NETWORKS INC. 40
TREE CARE INOUSTRY ASSOCIATION 44
TRL INC. 30
TULANE UNIVERSITY 42
U.S. OEPARTMENT OF JUSTICE 8
ULTIMUS INC. 8
UNISYS CORP. 12
UNITEO PARCEL SERVICE INC. 30,42
UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL 19
VERIZON COMMUNICATIONS 40
VERMONT INFORMATION PROCESSING INC. 44
VITRIA TECHNOLOGY INC. 14
VOCERA COMMUNICATIONS INC. 30
WAL-MART STORES INC. 30
WALTER REEO ARMY MEOICAL CENTER 10
WI-FI ALLIANCE 41
WIRELESS MATRIX CORP. 38
WORLO WIOE WEB CONSORTIUM 7
YAHOO INC 6,23

ADVERTISER'S INDEX

Advanced Micro Devices 56
www.amd.com
Cisco 28
www.cisco.com
Computer Associates 4
www.ca.com
Dell 18,
www.dell.com
F5 Networks 17
www.f5700m.com
IBM e-Server 2 3
www.ibm.com
Innovative Technology Awards xx
www.computerworld.com/researchy/innovativstech
Internet Security Systems 15
www.iss.net
InterSystems Caché 9
www.intersystems.com
Microsoft IT Desktop 32-33
www.microsoft.com
Microsoft News Flash 11
www.microsoft.com
Microsoft Windows 2003 20-21
www.microsoft.com
SeeBeyond 24-25
www.seebeyond.com
Tibco 26
www.tibco.com
Veritas 13
www.veritas.com

Continued from page 1

Pfizer

ing distributed to the employees, who typically work out of their homes, will also include built-in 802.11b Wi-Fi wireless LAN access points and cards.

Stallard declined to comment about the cost of the broadband installation or the return on investment Pfizer expects. But he said the network should save time for sales reps by speeding up the process of synchronizing CRM data with the company's back-end systems, which chews up an average of two hours per day for workers using dial-up connections, according to Stallard.

In addition, the broadband capabilities will let the remote workers use Web conferencing software on their IBM ThinkPad notebooks to take part in internal meetings that would otherwise require at least two days of travel, Stallard said.

Remote workers reported an average 33% productivity increase as a result of getting broadband connections, according to a recent survey of 865 users that was funded by the AT&T Foundation and released last week by the International Telework Association & Council (ITAC) in Wakefield, Mass.

Tim Kane, president of ITAC and CEO of Kinetic Workplace Inc., a telecommuting consultancy in Pittsburgh, said he doesn't know of any companies that have installed broadband networks on the scale of the one planned by Pfizer.

Pfizer is outsourcing development and management of the broadband network to Norcross, Ga.-based Netifice Communications Inc., which started rolling out technology to Pfizer employees in March. About 600 users are now live, and roughly 1,000 will be added monthly, Netifice said.

Stallard said Pfizer officials decided not to do the work internally because of the complexity of dealing with cable TV and local telephone companies across the U.S.

Because each of those companies has its own variations on modem and router setups, Stallard said, as many as 3,000 different network configuration settings may have to be distributed for installation on the home-office routers. "I could not deal with it," he said.

Greg Davis, vice president of marketing at Netifice, said the company will provide Pfizer workers with VPN client software that supports the triple Data Encryption Standard and is sold by AT&T Corp.'s global network division. Meanwhile, Netifice plans to use routers and remote network management and provisioning software developed by Alameda, Calif.-based Netopia Inc.

AT A GLANCE

Pfizer's Distributed Broadband Network

- **Will provide** cable or DSL lines to almost 80% of the company's 13,000-person sales force.
- **Utilizes** preconfigured routers so self-install time for end users should average 10 minutes.
- **Includes** built-in Wi-Fi access points and cards as part of the network hardware.
- **Is designed** to dramatically reduce the time needed to synchronize CRM data with Pfizer's corporate systems.

Jeff Porter, vice president of marketing at Netopia, said the four- or eight-port routers are being configured to support the type of connection — cable modem or DSL — used by various Pfizer sales reps.

The routers also include an installation wizard that fetches the correct settings for each device from a Netifice-hosted Window NT server running Netopia's Java-based net-Octopus software, Porter said.

Stallard said he doesn't plan to activate the network's Wi-Fi features until Netopia and Netifice develop a way to automatically configure the client cards for individual end users — a task that Porter estimated could be finished this summer.

Some of the 3,000 or so sales employees who initially won't get access to the network are in locations so remote that securing broadband lines for them may be impossible, Stallard said. He added that Pfizer might eventually use satellites to connect the orphaned users to the network. ◗

Continued from page 1

Windows 2003

named Yukon, which will soon go into beta testing.

Exchange Server users have one choice. The only version that can be installed on the new operating system is Exchange 2003, and it's not due until summer.

"I think Microsoft owes it to their customers to ensure backwards compatibility and interoperability for at least five years," said Derek Gee, vice president and director of system architecture and integration at Ameriquest Mortgage Co. in Orange, Calif.

"Another reason Microsoft should support some of their older versions is to maintain customer loyalty," said Steve Sommer, CIO at Hughes, Hubbard & Reed LLP in New York. "There are some big customers that cannot afford to upgrade right now."

Many users are sympathetic to Microsoft's claims that extensive security, Web server and Active Directory improvements affect not only the operating system but also any applications that rely on it. They said they understand why some older applications won't be supported on Windows Server 2003.

"If it's really a major upgrade, then Microsoft can't be expected to make substantial improvements to the product while at the same time bringing along all its old baggage," said Rich Eber, development service director at Hawaiian Electric Co. in Honolulu.

But if users find that the core Windows server operating system hasn't changed internally as much as Microsoft has portrayed, "there should be a backlash against this lack of support," Eber said.

Neville Teagarden, CIO at Navigant International Inc. in Englewood, Colo., said security has spurred his company to invest time during the past year to get the latest versions of Microsoft software. "My CIO colleagues should be asking themselves whether they can afford the security risks of using older versions of Microsoft products," he said.

MORE ONLINE

Microsoft officials elaborate on the Windows Server 2003 incompatibility issues:

QuickLink 38231
www.computerworld.com

Those users who have lagged on upgrades, however, may not be pleased to see that Microsoft won't be supporting older versions of its software on the latest operating system.

"Expecting companies to upgrade everything in their infrastructure to get the features from a single product, in this case Windows 2003, is unrealistic," said Dave Curran, manager of IT at CE Franklin Ltd. in Calgary, Alberta. "This smells of a pure money grab by Microsoft."

Curran said CE Franklin will delay its upgrade to Windows Server 2003 by at least 12 months because of the application compatibility issue. The oil and gas equipment supplier is still running Exchange 5.5 on Windows NT 4.0, and a simultaneous migration would be "too much for us to undertake in a single upgrade," he said.

Alejandro Bombaci, CIO at Empresas Polar, a consumer goods maker and distributor in Caracas, Venezuela, said his company typically migrates the operating system — the "enabler layer" — and then the applications. "Upgrading both at the same time is too risky," he said, although in his case, the upgrades mostly involve non-Microsoft applications.

Most Microsoft server applications will run fine in an environment that has a mix of servers running Windows Server 2003 and Windows Server 2000, said Barry Goffe, group manager of Microsoft's server platform division. Exchange 2000, for instance, can coexist in a Windows Server 2003 environment, as long as it's installed on a server running Windows 2000 with Service Pack 3.

With about 350 code changes in Windows Server affecting Exchange, Microsoft said it decided that customers would be better served if it focused development on Exchange 2003 rather than on updating old versions, so it could take advantage of improvements in Internet Information Server (IIS) 6.0. Exchange 2000 and 2003 rely heavily on IIS for Internet-based protocol services.

But some users are upset by the decision. For example, Rick Weaver, director of technical architecture at Hilton Hotels Corp. in Memphis, said Hilton is running a mix of Exchange 5.5 and 2000 and does slow migrations "because they are extremely painful."

"It would encourage acceptance of the new operating system if the old apps ran on it," Weaver said. ◗

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BPA ABM RED TAG

FRANK HAYES ■ FRANKLY SPEAKING

Business Leads IT

AT A BREAKFAST MEETING at last week's Cutter Consortium Summit 2003 conference, one deep thinker pointed to FedEx's Fred Smith as a CEO who really understands the value of IT. "I remember Fred Smith talking about IT like it was more important than the planes," said Cutter consultant Michael Mah.

Well, yeah. That's because at FedEx, IT *is* more important than the planes. Without its package-tracking systems, FedEx can't charge premium prices for overnight delivery. IT makes the money flow. No wonder Fred Smith understands its value.

And no wonder so many other CEOs don't. Much of the discussion at that breakfast meeting was about how to market IT to other parts of a business (see story, QuickLink 38135). People talked about positioning, about explaining IT's unique situation in the organization, about translating techspeak into boardroomspeak.

Yeah, sure, fine. Think that'll actually convince anyone of IT's value as a core competency at your company?

There's an easy test for what qualifies as a core competency in a business. Are you directly involved in extracting money from customers in exchange for products or services? Then you're core. If not, you're not.

Your CEO knows that. And if IT is core in your business, your CEO knows that too.

But it's probably not. And positioning it and explaining it won't change that situation.

Neither will translating techspeak into boardroomspeak, which has long been a Holy Grail for IT executives. Look, no one in the boardroom *wants* a translation of techspeak — any more than they want translations of salesspeak or logistics-speak or shop-floor-speak.

If you're translating techspeak to boardroomspeak, that means you're going about it wrong. You're bringing technology to the table and trying to explain how it's valuable to the business. That's backward. You should be identifying business needs and then explaining how technology can meet them.

In other words, you should start your thinking with the business, not with the technology.

And to do that, you've got to *know* your business. If you want to start making IT core in your company, you need to know as much about how your company actually builds and moves and sells and collects money for products and services as you know about speeds and feeds and bits and wires.

You need to know your company's business processes inside and out. Not the theory, not the wishful thinking that project specifications get based on, but how it's actually done.

You need to know *why* it's done that way — what was tried and failed, what was never tried because politics or business conditions or lack of the right technology prevented it.

You need to know what can be changed and what's sacrosanct. You need to know where a little change will yield big results. You need to know who will help make that happen.

You won't find out any of those things by researching technology. You'll only do it by talking first to business-side executives, then to the managers who work for them. Talk up the opportunity for them to look good, the chance for them to take credit if you can find ways of making their operations more successful.

Then, once they've said yes, stop talking. Observe. Listen. Ask questions. Look for the places where IT really could transform how they do your company's business.

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

That's how you'll get a shot at proving IT's value as a core competency — through transformation, not marketing.

Sure, you can use marketing techniques to raise IT's profile. You can remind other departments that IT does deliver value. You can make the case for IT's usefulness.

But if you can find a way to make IT as core to your business as it is to FedEx, you can bet your CEO will value IT every bit as much as Fred Smith. ◗

SHARK TANK

Just Exactly What It Says

These tapes contain pricing and inventory data, and they're labeled "Confidential – Do not remove from computer room!" So when an IT pilot fish gets a job ticket to duplicate several confidential tapes and send them off, all to the same programmer, he checks with the security manager – who just shrugs. "The labels apply to the originals only," the security manager says. "I don't care what you do with the copies."

I Got Rhythm

Why is this user's PC flickering and rebooting? It checks out fine for support pilot fish, so he tells user, "Do what you normally do." She sits down and goes to work – and the system soon reboots. "The fourth time, I noticed she was tapping her foot to the music on the radio," fish says. "Her foot was hitting the power strip on/off switch just enough to cause the system to reboot."

It's Called the Help Desk, Right?

Some of the people I sent this document to never received it, user tells help desk pilot fish. Were all the copies sent as one e-mail with multiple recipients? fish asks. "I don't understand," user says. Fish tries again: Did you send the document as a single e-mail to all the people, or did you send a separate e-mail to each person? "What do you mean?" says exasperated user. "I gave the copies to Steve, the courier."

No Problem

Database pilot fish is tasked with verifying a database created by this bank's international loan department for government-guaranteed loans. There's lots of data for each loan – but there's nowhere to record data about repayments of the loan's principal, fish points out. "That's not a problem," department staffer tells him. "We've never had anyone repay any principal on any of these loans."

Ingenuity

When a user complains about an unreadable floppy disk and "warped colors" on a monitor, IT pilot fish finds the disk stuck to the monitor's side with a magnet. That monitor's case is plastic, fish says. How did you get it to stick? "She pulled off the magnet to reveal *another* magnet," groans fish, "attached to the monitor with foam tape."

That Culd Dew Itt

Help desk pilot fish immediately spots the likely problem when she gets this trouble ticket: "User when she sends emails to other peopel they never get them she can send about 6 emails to the same person and they will get 3 of them she said that her Nme is misspelled and maybe that is the problem."

FEED THE SHARK! Send your true tale of IT life to sharky@computerworld.com. You snag a snazzy Shark shirt if we use it. And check out the daily feed, browse the Sharkives and and sign up for Shark Tank home delivery at computerworld.com/sharky

Call for Nominations

Is your organization making the most of technology on the cutting edge?

We want to hear about it!

Computerworld's Innovative Technology Awards 2003 will honor the industry's top vendors that are helping their customers achieve business value through technology.

Tell us about your successful technology application and nominate your vendor online at **www.computerworld.com/research/innovativetech**

ABOUT THE AWARDS

For the second year, these customer choice awards will spotlight leading vendors and showcase how their customers are using technology to solve business problems in real-world settings. Nominations from IT customers will be collected from now through May 12, 2003. Nominated vendors will be surveyed about their technology applications. A panel of outside experts and Computerworld editors will review the surveys and choose the winners.

Survey results and stories that offer practical advice from IT leaders using these technologies will be published in the September 22, 2003, issue, as well as online at Computerworld.com.

COMPUTERWORLD
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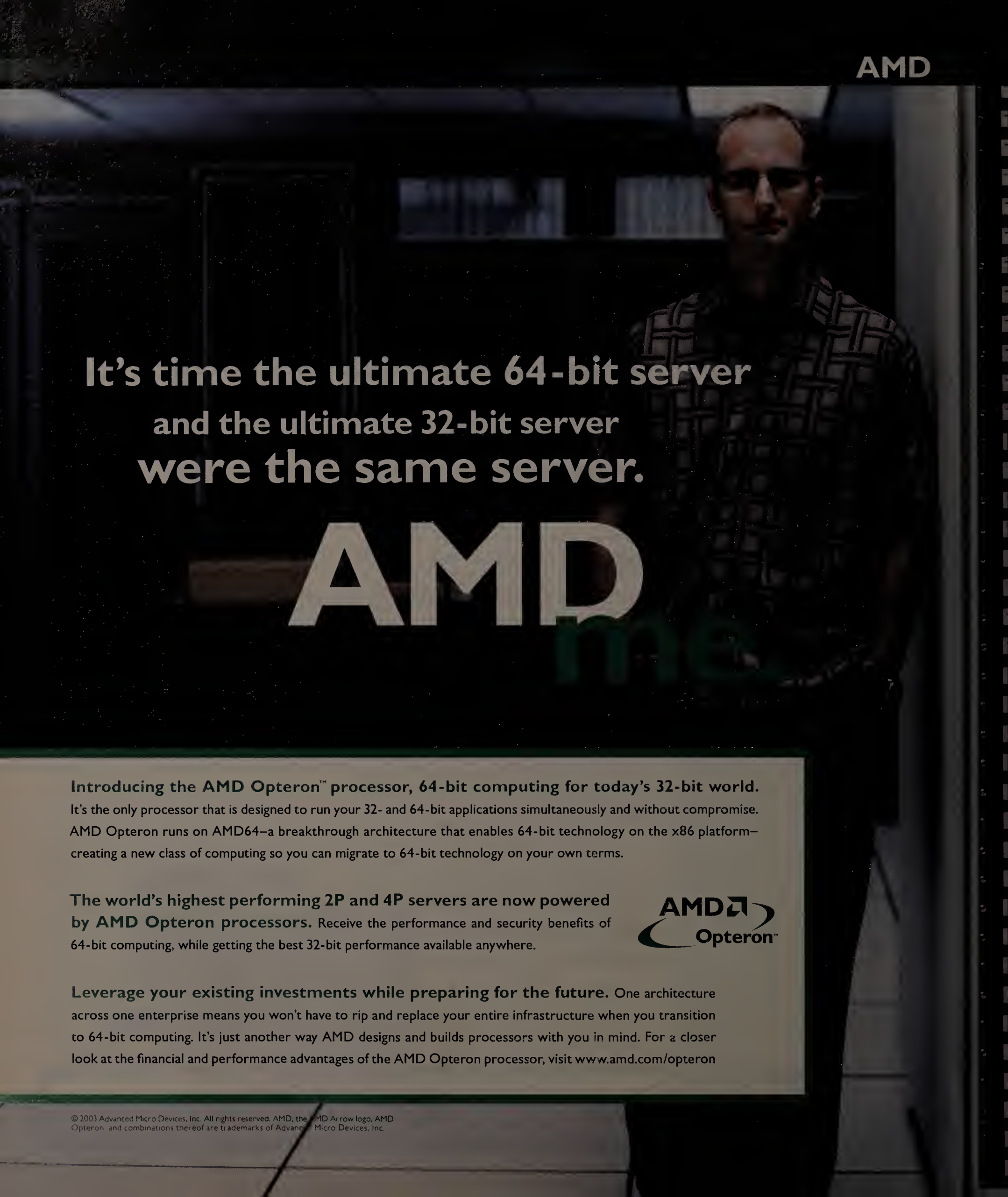
Need More Information?

Contact InnovativeTech@computerworld.com.
But hurry! The nomination deadline is May 12, 2003.



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